- CO: 14 pounds per hour (lb/hr)
- $NO_x$: 1 ton per year (tpy)
- $SO_2$: 1 tpy and 0.2 lb/hr
- $PM_{10}$: 1 tpy and 0.2 lb/hr

The second level of modeling thresholds identifies emissions rates below which modeling is typically not required; however, the Department may make the determination on a case-by-case basis considering the characteristics of the release and the potentially exposed public. These threshold levels are as follows:

- CO: 70 lb/hr
- $NO_x$: 7 tpy
- $SO_2$: 7 tpy and 0.9 lb/hr
- $PM_{10}$: 7 tpy and 0.9 lb/hr

Based on worst-case emission estimates, emissions of CO are below the levels of the first threshold; therefore, modeling is not required for this pollutant. $SO_2$ emissions are above the first threshold for hourly emissions assuming the units operate continuously for an hour, but below the second threshold. However, annual $SO_2$ emissions are well below the first threshold level. The emergency generator is the primary source of the $SO_2$ emissions. Based on discussions with the Department's modeling staff, $SO_2$ modeling is not required because during normal operations (i.e., non-emergencies), emissions will remain below the first level threshold. However since worst-case emissions of $NO_x$ and $PM_{10}$ will be above the second threshold, modeling was conducted for these pollutants.

Additionally, the modeling will be used to demonstrate that emissions of perchloroethylene (a TAP) will not cause an exceedance of the Acceptable Ambient Concentration (AACs) set forth in IDAPA 58.01.01.585 and 586. Other TAPs are below the Department's threshold levels, so modeling is not required.

In summary, the present modeling analysis is being conducted to: (i) demonstrate that at the worst-case scenario of emissions and exhaust parameters, emissions under the facility emission cap will not cause an exceedance of the National Ambient Air Quality Standards (NAAQS) for $PM_{10}$ and $NO_2$; and (ii) demonstrate that emissions of perchloroethylene (the only TAP that exceeds the Screening Emission Level in IDAPA 58.01.01.586) will not exceed the AAC. Modeling is being also being used to show future growth at the facility and demonstrate that it can be accommodated with the assurance that the emissions will not cause adverse impacts as long as they remain below the FEC.

## 3.2 MODEL DESCRIPTION/JUSTIFICATION

The American Meteorological Society (AMS) and the U.S. Environmental Protection Agency (EPA) jointly formed the AMS/EPA Regulatory Model Improvement Committee (AERMIC) to develop an accurate air quality model. They developed the AERMIC Dispersion Model (AERMOD). The AERMOD model (Version 07026) is accepted for regulatory analyses and is the recommended model for determining ground-level ambient air concentrations in all types of terrain. AERMOD was used for the criteria and TAP pollutant analyses.

Under stable conditions, AERMOD uses a steady-state, Gaussian plume equation to calculate ambient concentrations from stacks. In unstable conditions, AERMOD uses a non-Gaussian probability density function to calculate ambient concentrations. Input variables to the model include: emission rates, stack heights, meteorological data, receptor locations, terrain elevations, and stack gas characteristics. The model can also be used to evaluate the effects of aerodynamic wakes and eddies that are formed by buildings and other structures on plume dispersion (PRIME model).

Review of a topographic map of the area around the proposed Biopol facility indicates that some of the receptors are in complex terrain. AERMOD has been developed to incorporate complex terrain considerations into the model output.

EPA's Building Profile Input Program (BPIP) algorithms were to determine the impacts of building downwash. Buildings on site were in the analysis; there are no significant structures off site. The results of the BPIP analysis were incorporated into the AERMOD model.

IES uses a purchased software package (Trinity Breeze, Version 6.2.2) to interface with AERMOD to assist in setting up and running the model.

AERMOD is classified by the EPA as a preferred/recommended air quality model for refined analyses. Based on the model's incorporation of algorithms to address complex terrain, multiple buildings and stacks, and EPA's "approval" of this model, AERMOD is an appropriate model for this application.

The proposed methodology for conducting the air dispersion analysis was submitted to the Department for review on March 21, 2007, and approved on March 27, 2007. Several changes to the protocol were discussed with the Department and were documented in an e-mail to the Department. Correspondence with the Department is provided in Attachment 3-A.

## 3.3 EMISSION AND SOURCE DATA

Table 3-1 presents a summary of the modeled emission rates for this project. Emission calculations are provided in Attachment 2 of the FEC application. This is a new facility, so there are no existing emission sources at the facility; actual emissions are not provided. Table 3-1 presents potential (worst-case) emissions.

All of the sources were modeled running for 8,760 hours per year, except for the emergency generator. The generator was modeled at 500 hours per year; therefore, two model runs were conducted for $PM_{10}$ – one for the higher short-term emission rate and a second for the annual rate. Additionally, for the short-term model run, the model was set up so that the generator operated for 1 hour each day.

**TABLE 3-1**
**POTENTIAL EMISSION RATES USED IN AIR DISPERSION**
**ALK-ABELLÓ , POST FALLS, IDAHO**

| Model ID | Source Description | $NO_2$ | | $PM_{10}$ | | Perc. | |
|---|---|---|---|---|---|---|---|
| | | lb/hr | tpy | lb/hr | tpy | lb/hr | tpy |
| EF 2-1 | USM Purification Lab Hood Exhausts | NA | NA | 0.0831 | 0.364 | NA | NA |
| EF 3-1 | Pollen Lab Hood Exhausts | NA | NA | 0.5841 | 2.559 | 0.0379 | 0.166 |
| EF 4-1 | Process Development Lab Hood Exhausts | NA | NA | 0.2691 | 1.179 | NA | NA |
| EF 3-4 | Class 2 B2 Biological Safety Cabinet | NA | NA | 0.0429 | 0.188 | NA | NA |
| EF-VAC | House vacuum | NA | NA | 0.0429 | 0.188 | NA | NA |
| SRC 1 | Natural gas-fired boiler (125 bhp) | 0.3000 | 1.3 | 0.0500 | 0.200 | NA | NA |
| SRC 1 | Natural gas-fired boiler (125 bhp) | 0.3000 | 1.3 | 0.0500 | 0.200 | NA | NA |
| SRC 1 | Natural gas-fired boiler (125 bhp) (Future) | 0.3000 | 1.3 | 0.0500 | 0.200 | NA | NA |
| SRC 1 | Natural gas-fired boiler (125 bhp) (Future) | 0.3000 | 1.3 | 0.0500 | 0.200 | NA | NA |
| SRC 5 | Natural gas-fired boiler (50 bhp) (Future) | 0.1200 | 0.5 | 0.0200 | 0.080 | NA | NA |
| SRC 6 | Emergency generator (1,000 KW) | 12.36 | 3.1 | 0.4400 | 0.110 | NA | NA |
| EF 9-1 | Timothy Building dust collector (Future) | NA | NA | 0.2422 | 1.061 | NA | NA |
| SRC 24 | Spanish Mite Building media prep vent (Future) | NA | NA | 0.110 | 0.482 | NA | NA |
| EF SMDRY | Spanish Mite Fluid Bed Dryer | NA | NA | 0.0253 | 0.111 | NA | NA |
| SRC 26 | Spanish Mite Building pneumatic vent (Future) | NA | NA | 0.260 | 1.139 | NA | NA |
| SRC 27 | Ragweed Building fluid bed dryer (Future) | NA | NA | 0.215 | 0.942 | NA | NA |
| SRC 29 | Ragweed Building pneumatic vent (Future) | NA | NA | 0.040 | 0.175 | NA | NA |
| SRC 30 | Birch Building fluid bed dryer (Future) | NA | NA | 0.215 | 0.942 | NA | NA |
| SRC 32 | Birch Building pneumatic vent (Future) | NA | NA | 0.040 | 0.175 | NA | NA |

All of the emission sources listed on Table 3-1 were included in the modeling analysis; none were treated as inconsequential.

Table 3-2 provides anticipated source parameters (stack height, diameter, velocity, etc.) for the modeled sources of $PM_{10}$ emissions as well as source parameters that were actually used in the model for the modeled scenario. There may be differences between the anticipated parameters and the modeled parameters as the intent of the modeling was to show worst-case release scenarios.

As presently designed, all emission sources are point sources. However, in order to show worst-case dispersion and because the precise location of each exhaust vent on the roof has not been finalized, most of the emission sources were modeled as volume sources. The exceptions to this are the boiler exhausts and the emergency generator exhaust, which were modeled as point sources. Another note regarding the boiler exhausts, there are four identical boilers that will be located in the same area. In order to reduce model run times, the boilers were modeled with all of the emissions exhausting through a single stack.

The initial lateral dimensions ($\sigma_y$) for the point sources that were modeled as volume sources were calculated by dividing the length of the building, which included the emission source, by 4.3. The initial vertical dimensions ($\sigma_z$) were calculated by dividing the height of the building, which included the emission source, by 2.15. The release height was the height of the building as all of the sources will be located on top of buildings. Table 3-3 includes a summary of the source dimensions for each point source modeled as a volume source.

Attachment 3-B includes a facility plot plan for the site. Building dimensions are summarized on Table 3-4.

The ambient air boundary for the facility is the property line. The facility is located in an industrial park and is not used by the general public. Security measures, including signs, will be implemented to discourage public access to the property. This was discussed with the Department during a pre-application meeting on January 31, 2007; the Department concurs with this approach.

As indicated by the Department, there are no other emission sources in the vicinity of ALK-Abelló proposed site that need to be included in the modeling analysis.

The UTM coordinates of the approximate center of the facility are 499,676 meters east and 5,282,972 meters north. The street address of the facility is at the intersection of Lochsa Street and Clearwater Loop (east of Moyie Street) in Post Falls, Idaho.

**TABLE 3-2**
**STACK PARAMETERS USED IN $PM_{10}$ MODELING SCENARIOS**
**ALK-ABELLÓ , POST FALLS, IDAHO**

<table>
<tr><th rowspan="2">Model ID</th><th rowspan="2">Source Description</th><th rowspan="2">Type of Source</th><th rowspan="2">Base Elevation (ft)</th><th rowspan="2">Exhaust Temp. (F)</th><th colspan="3">Anticipated Parameters</th><th colspan="3">Modeled Parameters</th></tr>
<tr><th>Velocity (fpm)</th><th>Stack Diameter (ft)</th><th>Stack Height (ft)</th><th>Velocity (fpm)</th><th>Stack Diameter (ft)</th><th>Stack Height (ft)</th></tr>
<tr><td>EF 2-1</td><td>USM Purification Lab Hood Exhausts</td><td>Point</td><td>2,101.7</td><td>70</td><td>2,800</td><td>1</td><td>40</td><td>2,500</td><td>1</td><td>40</td></tr>
<tr><td>EF 3-1</td><td>Pollen Lab Hood Exhausts</td><td>Point</td><td>2,104.4</td><td>70</td><td>3,800</td><td>2</td><td>40</td><td>2,500</td><td>2</td><td>40</td></tr>
<tr><td>EF 4-1</td><td>Process Development Lab Hood Exhausts</td><td>Point</td><td>2,101.9</td><td>70</td><td>3,300</td><td>2.4</td><td>40</td><td>2,500</td><td>2.4</td><td>40</td></tr>
<tr><td>EF 3-4</td><td>Class 2 B2 Biological Safety Cabinet</td><td>Point</td><td>2,105.1</td><td>70</td><td>2,500</td><td>0.75</td><td>40</td><td>2,500</td><td>0.75</td><td>40</td></tr>
<tr><td>EF-VAC</td><td>House vacuum</td><td>Point</td><td>2,105.1</td><td>70</td><td>2,500</td><td>0.50</td><td>10</td><td>2,500</td><td>0.50</td><td>10</td></tr>
<tr><td>SRC 1</td><td>Natural gas-fired boiler (125 bhp)</td><td>Point</td><td>2,104.6</td><td>405</td><td>2,570</td><td>1.33</td><td>35.4</td><td rowspan="4">2,500</td><td rowspan="4">1.33</td><td rowspan="4">35.4</td></tr>
<tr><td>SRC 1</td><td>Natural gas-fired boiler (125 bhp)</td><td>Point</td><td>2,104.6</td><td>405</td><td>2,570</td><td>1.33</td><td>35.4</td></tr>
<tr><td>SRC 1</td><td>Natural gas-fired boiler (125 bhp) (Future)</td><td>Point</td><td>2,104.6</td><td>405</td><td>2,570</td><td>1.33</td><td>35.4</td></tr>
<tr><td>SRC 1</td><td>Natural gas-fired boiler (125 bhp) (Future)</td><td>Point</td><td>2,104.6</td><td>405</td><td>2,570</td><td>1.33</td><td>35.4</td></tr>
<tr><td>SRC 5</td><td>Natural gas-fired boiler (50 bhp) (Future)</td><td>Point</td><td>2,103.4</td><td>394</td><td>2,570</td><td>0.5</td><td>35.4</td><td>2,500</td><td>0.5</td><td>35.4</td></tr>
</table>

**TABLE 3-2**
**STACK PARAMETERS USED IN $PM_{10}$ MODELING SCENARIOS**
**ALK-ABELLÓ , POST FALLS, IDAHO**

| Model ID | Source Description | Type of Source | Base Elevation (ft) | Exhaust Temp. (F) | Anticipated Parameters | | | Modeled Parameters | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Velocity (fpm) | Stack Diameter (ft) | Stack Height (ft) | Velocity (fpm) | Stack Diameter (ft) | Stack Height (ft) |
| SRC 6 | Emergency generator (1,000 KW) | Point | 2,101.0 | 975 | 9,900 | 1 | 12 | 9,900 | 1 | 12 |
| EF 9-1 | Timothy Building dust collector (Future) | Point | 2,104.2 | 70 | 2,500 | 1.7 | 35.4 | 2,500 | 1.7 | 30.4 |
| SRC 24 | Spanish Mite Building media prep vent (Future) | Point | 2,100.2 | 70 | 2,500 | 0.8 | 35.4 | 2,500 | 0.8 | 30.4 |
| EF SMDRY | Spanish Mite Fluid Bed Dryer | Point | 2,100.0 | 100 | 2,500 | 0.39 | 30.4 | 2,500 | 0.39 | 30.4 |
| SRC 26 | Spanish Mite Building pneumatic vent (Future) | Point | 2,099.8 | 70 | 2,500 | 1.2 | 35.4 | 2,500 | 1.2 | 30.4 |
| SRC 27 | Ragweed fluid bed dryer (Future) | Point | 2,103.5 | 100 | 2,500 | 1.6 | 35.4 | 2,500 | 1.6 | 30.4 |
| SRC 29 | Ragweed pneumatic vent (Future) | Point | 2,101.2 | 70 | 2,500 | 0.6 | 35.4 | 2,500 | 0.6 | 30.4 |
| SRC 30 | Birch fluid bed dryer (Future) | Point | 2,103.0 | 100 | 2,500 | 1.6 | 35.4 | 2,500 | 1.6 | 30.4 |
| SRC 32 | Birch pneumatic vent (Future) | Point | 2,101.9 | 70 | 2,500 | 0.6 | 35.4 | 2,500 | 0.6 | 30.4 |

**TABLE 3-3**
**SUMMARY OF SOURCE DIMENSIONS FOR POINT SOURCES MODELED AS VOLUME SOURCES PERCHLOROETHYLENE ALK-ABELLÓ, POST FALLS, IDAHO**

| Model ID | Source Description | Initial Lateral Dimension (m) | Initial Vertical Dimension (m) | Release Height (m) |
|---|---|---|---|---|
| SRC 40 | Laboratory exhaust of PCE emissions | 8.1 | 2.8 | 6.1 |

**TABLE 3-4**
**BUILDING PARAMETERS**
**ALK-ABELLÓ , POST FALLS, IDAHO**

| Building Name | Height (ft) | Length (ft) | Width (ft) | Base Elevation (m) |
|---|---|---|---|---|
| Main Building | 29 | 223 | 115 | 641.65 |
| Utilities Section | 25 | 135 | 50 | 641.46 |
| Timothy Pollen Section | 25 | 135 | 28 | 641.40 |
| Shell Space | 25 | 223 | 92 | 641.15 |
| Future Space | 25 | 223 | 60 | 640.90 |

## 3.4 RECEPTOR NETWORK

A Cartesian receptor grid was used to determine the maximum off-site impact. Based on preliminary model runs, the maximum off-site concentration occurs at or near the property line. Therefore, a fine receptor grid was used near the property boundary and a course grid was used further away. The Cartesian receptor grid spacing around the facility for the analysis was as follows:

| | |
|---|---|
| Along Fenceline: | 25-meter spacing (minimum) |
| 0 to 0.2 km: | 25-meter spacing |
| 0.2 to 1.5 km: | 100-meter spacing |
| 1.5 to 4 km: | 500-meter spacing |

## 3.5 ELEVATION DATA

United States Geological Survey (USGS) Digital Elevation Model (DEM) files were imported to determine elevations. 7½-minute DEMs with a resolution of 30 meters were used. Based on the size of the proposed receptor grid, the Post Falls, Idaho and Liberty Lake, Washington-Idaho quadrangle DEM files were used.

## 3.6 METEOROLOGIGAL DATA

Meteorological data was provided by the Department. A 5-year period of data (1987-1991) from Spokane, Washington, was used for the analysis. The Department processed the data using AERMET and land use classification data for the vicinity of the meteorological station.

## 3.7 LAND-USE CLASSIFICATION

The area around the proposed site is classified as rural based on a review of the topographic maps of the area and first hand knowledge of the site. The specific break-down of the classification of the area for use in AERMET was provided by the Department.

## 3.8 BACKGROUND CONCENTRATIONS

Background concentrations for the area were provided by the Department and are as follows:

| | |
|---|---|
| $PM_{10}$: | 67 $\mu g/m^3$ for 24-hour averaging period |
| | 23.7 $\mu g/m^3$ for annual averaging period |
| $NO_2$: | 32 $\mu g/m^3$ for annual averaging period |

$PM_{10}$ background concentrations are based on monitoring data for the Post Falls area and the $NO_2$ background concentration is based on default background concentrations used by the Department for small town and suburban areas.

As requested by the Department, modeled impacts (before the inclusion of background concentrations) were increased by 20 percent to account for uncertainties in the meteorological data.

Additionally, as provided by the Department, there are no co-contributing sources in the area of the proposed facility, so only emissions from the ALK-Abelló facility were included in the analysis.

## 3.9 EVALUATION OF COMPLIANCE WITH STANDARDS

The results of the analysis show that under worst-case release parameters and maximum emission rates, the off-site ambient impact is below the NAAQS for $PM_{10}$ and $NO_2$ and below the AAC for perchloroethylene.

Table 3-5 shows that the results of the $PM_{10}$ analysis for the off-site impact from the proposed ALK-Abelló facility are below the primary and secondary National Ambient Air Quality Standards (NAAQSs) of 150 $\mu g/m^3$ on 24-hour basis and 50 $\mu g/m^3$ on an annual basis. The maximum off-site impacts, including background concentrations, are 145.8 $\mu g/m^3$ (sixth highest) on a 24-hour basis and 56.9 $\mu g/m^3$ on an annual basis. The results include the additional 20 percent factor requested by the Department. The maximum values occurred at the property line.

Table 3-6 shows the results for the $NO_2$ analysis. The results are below the NAAQS of 100 $\mu g/m^3$ on an annual basis. The maximum off-site concentration is 65.2 $\mu g/m^3$ (including the background concentration) on an annual basis. These results also include the additional 20 percent factor requested by the Department. The maximum values occurred at the property line.

Table 3-7 shows the results of the perchloroethylene analysis. The results indicate that highest estimated ambient concentration is 0.32 $\mu g/m^3$, which is below the AAC of 2.1 $\mu g/m^3$. The maximum concentration includes the 20 percent factor requested by the Department. The maximum values occurred at the property line and the emission source was modeled as a volume source.

The Department's completed checklist (Appendix C of the Department's Guidance Document) is provided in Attachment 3-C.

## 3.10 ELECTRONIC COPIES OF MODELING FILES

Data input and output files are included in Attachment 3-D. The files were compressed using WINZIP.

The following 7.5-minute USGS DEM files are being submitted:

- Post Falls
- Liberty Lake

**TABLE 3-5**
**SUMMARY OF AERMOD MODEL RESULTS: $PM_{10}$**
**AIR DISPERSION ANALYSIS – NAAQS EVALUATION**
**ALK-ABELLÓ , POST FALLS, IDAHO**

| Averaging Period | Primary NAAQS (µg/m$^3$) | Secondary NAAQS (µg/m$^3$) | Year | Highest Off-site Concentration (µg/m$^3$) | | Sixth Highest Off-site Concentration (µg/m$^3$) | |
|---|---|---|---|---|---|---|---|
| | | | | Without Background | Including Background | Without Background | Including Background |
| 24-hour | 150 | 150 | 1987 - 1991 | -- | -- | 78.8 | 145.8 |
| Annual | 50 | 50 | 1987 - 1991 | 23.2 | 46.9 | -- | -- |

Note: Off-site concentrations include 20 percent "safety factor" as requested by the Department.

**TABLE 3-6**
**SUMMARY OF AERMOD MODEL RESULTS: $NO_2$**
**AIR DISPERSION ANALYSIS – NAAQS EVALUATION**
**ALK-ABELLÓ, POST FALLS, IDAHO**

| Averaging Period | Primary NAAQS ($\mu g/m^3$) | Secondary NAAQS ($\mu g/m^3$) | Year | Highest Off-site Concentration ($\mu g/m^3$) | |
|---|---|---|---|---|---|
| | | | | Without Background | Including Background |
| Annual | 100 | 100 | 1987 | 33.2 | 65.2 |
| | | | 1988 | 29.5 | 61.5 |
| | | | 1989 | 26.9 | 58.9 |
| | | | 1990 | 30.4 | 62.4 |
| | | | 1991 | 27.5 | 59.5 |

Note: Off-site concentrations include 20 percent "safety factor" as requested by the Department.

**TABLE 3-7**
**SUMMARY OF AERMOD MODEL RESULTS: PERCHLOROETHYLENE**
**AIR DISPERSION ANALYSIS – TAPS EVALUATION**
**ALK-BELLÓ, POST FALLS, IDAHO**

| Averaging Period | TAP ($\mu g/m^3$) | Year | Highest Off-site Concentration ($\mu g/m^3$) | |
|---|---|---|---|---|
| | | | Without Background | Including Background |
| Annual | 2.1 | 1987-1991 | 0.32 | 0.32 |

Note: Offsite concentrations include 20 percent "safety factor" as requested by the Department.

ATTACHMENT 3-A

DISPERSION MODELING PROTOCOL, DEPARTMENT COMMENTS, AND FOLLOW-UP CORRESPONDENCE

IES ENGINEERS

1720 Walton Road, Blue Bell, PA 19422 610-828-3078 Fax 610-828-7842

March 21, 2007

E-MAIL AND FIRST CLASS MAIL
Mr. Kevin Schilling
Air Quality Division
Idaho Department of Environmental Quality
1410 North Hilton
Boise, ID 83706

Subject: Dispersion Modeling Protocol
Biopol Laboratory, Inc.
Post Falls, Idaho
IES Project No. EHS07308.01

Dear Mr. Schilling:

On behalf of Biopol Laboratory, Inc. (Biopol), IES Engineers is pleased to submit this protocol for conducting the air dispersion modeling for the proposed Biopol facility in Post Falls, Idaho. The purpose of the modeling is twofold: (i) to determine the potential impacts of the proposed construction on the ambient air quality; and (ii) to establish emission limits to be incorporated in a Facility Emission Cap (FEC) permit.

As you know, Biopol will be submitting an application for a FEC permit under the Permit-to-Construct (PTC) program. The project schedule is very tight; therefore, we would appreciate the Department's expeditious review of this protocol. Additionally, as we discussed during our March 7, 2007, conference call, the Department will be providing the following information, which we would also appreciate obtaining as soon as possible:

- Five years of pre-processed meteorological data for the Post Falls area
- Background ambient air quality concentrations
- Source parameters for any nearby facilities that may need to be included in the model

This protocol is being submitted to satisfy the requirements of IDAPA 58.01.01.175 through181. The protocol follows the Department's *Modeling Protocol Template* as well as the appropriate requirements contained in the *State of Idaho Air Quality Modeling Guideline.* The following sections are included in this protocol:

- Project Description and Purpose of Modeling
- Modeling Applicability Assessment – including criteria pollutants and toxic air pollutants (TAPs)
- Modeling Analyses Methodology
- Model Input Data
- Outline for Modeling Report

## 1.0 PROJECT DESCRIPTION AND PURPOSE OF MODELING

Biopol Laboratory, Inc. (Biopol) is proposing to construct a new allergen purification facility in an industrial park on Lochsa Street in Post Falls, Idaho. The UTM coordinates of the approximate center of the facility are 499,676 meters east and 5,282,972 meters north. The facility will purify harvested pollen from timothy hay and other allergens for further processing elsewhere to produce vaccines for individuals with allergies. The facility will be constructed in phases; the modeling analysis will provide for the equipment that will be included in all phases anticipated over the next five years.

Emission sources at the facility will include boilers, an electric generator, water heaters, rooftop air handling units (which include pre-heating and humidification sections), house vacuum systems, laboratory hood exhaust vents, and process operations, which include a fluidized bed dryer and a filter/dryer. These operations will emit criteria pollutants: oxides of nitrogen ($NO_x$), carbon monoxide (CO), sulfur oxides ($SO_x$), volatile organic compounds (VOC), particulate matter; and toxic air pollutants (TAPs): acetone, ethanol, isopropyl alcohol, methanol, tetrachloroethylene (perchloroethylene), and petroleum ether. Emission control equipment is used to reduce emissions from two process sources: a high efficiency particulate air filter (HEPA) on the fluidized bed dryer/separator, and a vent condenser on the filter/dryer (de-fatting operation), both of which are associated with the Timothy Pollen processing operations.

Based on preliminary emission calculations, the proposed facility will be a minor source for all pollutants. In order to obtain the maximum operating flexibility, Biopol will be applying for a FEC permit, which will establish caps for each regulated pollutant and will allow the installation of currently unspecified equipment without having to re-open the permit. As part of the FEC requirements, air dispersion modeling must be performed for particulate matter less than or equal to 10 micrometers ($PM_{10}$), sulfur dioxide ($SO_2$), nitrogen dioxide ($NO_2$), and CO. Additionally, the model will be used to demonstrate that emissions of perchloroethylene (a TAP) will not cause an exceedance of the Acceptable Ambient Concentration (AACs) set forth in IDAPA 58.01.01.585 and 586.

The modeling analysis is being conducted to: (i) demonstrate that at the worst-case scenario of emissions and exhaust parameters, emissions under the facility emission cap will not cause an exceedance of the National Ambient Air Quality Standards (NAAQS) for $PM_{10}$, $SO_2$, $NO_2$, and CO; and (ii) demonstrate that emissions of perchloroethylene (the only TAP that exceeds the Screening Emission Level in IDAPA 58.01.01.586) will not exceed the AAC. In establishing the FEC, we will identify a number of scenarios of stack heights and locations, exhaust gas directions and velocities, and emission rates. We will use the model to evaluate each of these scenarios and identify the worst-case scenario from an ambient air quality perspective. Accordingly, future growth at the facility can be accommodated with the assurance that the emissions will not cause adverse impacts as long as they remain below the FEC.

## 2.0 EMISSION DATA

Biopol is proposing to limit its combined emissions of all regulated pollutants to between one and ten tons per year. Preliminary estimates of the potential facility-wide emissions are as follows:

| Pollutant | Preliminary Estimate (tpy) | Sources |
|---|---|---|
| $PM_{10}$ | 0.80 | Natural gas and diesel fuel combustion, process sources |
| $SO_2$ | 0.59 | Natural gas and diesel fuel combustion |
| $NO_2$ | 3.08 | Natural gas and diesel fuel combustion |
| CO | 2.97 | Natural gas and diesel fuel combustion |
| Perchloroethylene | 0.08 | Process sources |

Peak, or worst-case emissions will be used in the dispersion analysis. As a conservative measure, we propose to model the peak emissions assuming 8,760 hours of operation per year. For sources whose design does not allow continuous operation (e.g., emergency electric generator), separate model runs will be conducted to demonstrate worst-case short-term and long-term ambient impacts.

All facility emission rates are well below the applicability thresholds of the Prevention of Significant Deterioration (PSD) and non-attainment New Source Review programs.

## 3.0 MODELING APPLICABILITY ASSESSMENT

### 3.1 Criteria Pollutant Modeling Applicability

A modeling analysis is generally required with each permit application for new construction with emissions exceeding the modeling thresholds. In Biopol's case, emissions are below the Department's internal modeling thresholds; however, since Biopol is applying for a FEC permit, modeling is required for criteria pollutants ($PM_{10}$, $SO_2$, $NO_2$, and CO). As we discussed, lead and volatile organic compounds (VOCs) are not being included in the analysis. The only source of lead emissions would be trace quantities from combustion of natural gas or diesel fuel. VOC emissions are low (approximately 0.69 tons per year) and there is no viable model available for modeling VOC emissions from individual facilities.

All stationary sources at the facility with the potential to emit $PM_{10}$, $SO_2$, $NO_2$, or CO will be included in the analysis, except that $PM_{10}$ emissions from vehicle traffic on the facility property will not be included. "Trivial" activities, as defined by the Department, will also not be included in the assessment. The facility roadways and parking lots will be paved, and given the nature of the operations at the facility, emissions from traffic will be minimal.

### 3.2 TAPs Modeling Applicability

Dispersion analysis of TAP emissions associated with the project is required if total emissions increases exceed TAP-specific regulatory screening emission levels (ELs). In Biopol's case, perchloroethylene is the only TAP for which emissions exceed the EL for carcinogens set forth in IDAPA 58.01.01.586; therefore, an air dispersion analysis is required for this pollutant. Perchloroethylene will be used in Timothy pollen processing and the Small Scale Manufacturing (SSM) operations and will be exhausted to the atmosphere through the laboratory ventilation system.

## 4.0 MODELING METHODOLOGY

### 4.1 Model Used

The American Meteorological Society (AMS) and the U.S. Environmental Protection Agency (EPA) jointly formed the AMS/EPA Regulatory Model Improvement Committee (AERMIC) to develop an accurate air quality model. They developed the AERMIC Dispersion Model (AERMOD). The AERMOD model (Version 07026) is accepted for regulatory analyses and is the recommended model for determining ground-level ambient air concentrations in all types of terrain. We propose to use AERMOD for the criteria and TAP pollutant analyses.

Under stable conditions, AERMOD uses a steady-state, Gaussian plume equation to calculate ambient concentrations from stacks. In unstable conditions, AERMOD uses a non-Gaussian probability density function to calculate ambient concentrations. Input variables to the model include: emission rates, stack heights, meteorological data, receptor locations (including sensitive receptors such as schools or hospitals), terrain elevations, and stack gas characteristics. The model can also be used to evaluate the effects of aerodynamic wakes and eddies that are formed by buildings and other structures on plume dispersion (PRIME model).

Review of a topographic map of the area around the proposed Biopol facility indicates that some of the receptors are in complex terrain. AERMOD has been developed to incorporate complex terrain considerations into the model output.

EPA's Building Profile Input Program (BPIP) algorithms will be used to determine the impacts of building downwash. Buildings on site will be included in the analysis; there are no significant structures off site. The results of the BPIP analysis will be incorporated into the AERMOD model.

IES uses a purchased software package (Trinity Breeze, Version 5.2.1) to interface with AERMOD to assist in setting up and running the model. However, we anticipate running the model without a graphical user interface as well.

4.2 Criteria Pollutant Modeling Methodology

This is a new facility; therefore, all proposed emission sources that potentially emit criteria pollutants ($PM_{10}$, $SO_2$, $NO_2$, and CO) will be included in the analysis, except that $PM_{10}$ emissions from the paved roads will not be included.

As we discussed, other nearby sources (those within approximately 1,000 feet) will be included in the modeling analysis. Buck Knives is located adjacent to the property. As requested, we provided UTM coordinates (see Section 1.0) so that the Department can provide emissions, coordinates, and exhaust parameters for nearby sources that should be included in this analysis.

Modeling will be conducted to demonstrate compliance with the following ambient concentrations and averaging periods:

| **Pollutant** | **Averaging Time** | **Standard ($\mu g/m^3$)** | **Model Value Used** |
|---|---|---|---|
| CO | 1-hour | 40,000 | Second highest hourly value (i.e., not to be exceeded more than once a year) |
| | 8-hour | 10,000 | Second highest hourly value (i.e., not to be exceeded more than once a year) |
| $NO_2$ | Annual | 100 | Maximum value (i.e., not to be exceeded in any calendar year) |
| $SO_2$ | 3-hour | 1,300 | Second highest hourly value (i.e., not to be exceeded more than once a year) |
| | 24-hour | 365 | Second highest hourly value (i.e., not to be exceeded more than once a year) |
| | Annual | 80 | Maximum value (i.e., not to be exceeded in any calendar year) |
| $PM_{10}$ | 24-hour | 150 | Second highest daily value (i.e., not to be exceeded more than once a year) |
| | Annual | 50 | Maximum value (i.e., not to be exceeded in any calendar year) |

Background concentrations will be included in the analysis. The Department will provide the background concentrations for each modeled criteria pollutant ($PM_{10}$, $SO_2$, $NO_2$, and CO).

## 4.3 TAP Modeling Methodology

A screening-level dispersion analysis will be conducted to demonstrate that the maximum off-site concentration of perchloroethylene will not exceed the AAC (2.1 $\mu g/m^3$ averaged over a 1-year period). We will model the maximum perchloroethylene emission rate and the worst-case dispersion parameters. The modeling will be conducted using AERMOD and the highest annual concentration will be compared against the AAC.

## 5.0 MODEL INPUT DATA

Table 1 presents a summary of the model input parameters that are proposed for the analysis using AERMOD.

The ambient air boundary for the facility is the property line. The facility is located in an industrial park and is not used by the general public. Security measures, including signs, will be implemented to discourage public access to the property. This was discussed with the Department during a pre-application meeting on January 31, 2007; the Department concurs with this approach.

A Cartesian receptor grid and a discrete receptor grid will be used to determine the maximum off-site impact. Based on screening-level model runs conducted using EPA's SCREEN 3 model, the anticipated maximum off-site concentration is well within 1 kilometer of the facility. A receptor grid extending 3 kilometers in all directions from the approximate center of the facility is proposed. The grid spacing for the grid is 50-meters. Receptors will be placed along the property line at a minimum spacing of 25 meters.

**Table 1**
**Summary of AERMOD Model Input Parameters for Air Dispersion Analysis**

| Model Option | Value Selected |
|---|---|
| Calculate concentration or deposition | Concentration |
| Rural or urban option | Rural; specific breakdown, by sector, to be provided by DEQ. |
| Dry or wet depletion | None |
| Regulatory default option | Yes |
| Averaging period | $PM_{10}$: 24-hour and annual<br>CO: 8-hour and 1-hour<br>$SO_2$: 3-hour, 8-hour, and annual<br>$NO_2$: annual<br>TAP: annual |
| Meteorological data | Data to be provided by DEQ. |
| Wind profile exponents | Default |
| Vertical temperature gradients | Default |
| Grid system | Discrete receptors every 25 m at property line and Cartesian grid system as 3 km around the plant at 50-m spacing. |
| Terrain elevations | Elevated; elevations are imported from 7.5-Minute USGS Digital Elevation Models at 30 m resolution |
| Flagpole receptors | Option not used |
| Building wake effects | Yes, as determined by EPA's BPIP model and incorporated into AERMOD. |

## 5.1 Meteorological Data

Based on our recent discussions, the Department will provide meteorological data for the most recent five-year period, to be used in the AERMOD analysis. The Department has determined that these data are representative of the Post Falls area. It is our understanding that the Department has already processed the meteorological data.

## 5.2 Emission Release Parameters

Source parameters will be based on anticipated worst-case information, such as emission rates and release parameters. IES anticipates performing several modeling runs to ensure that the worst-case release scenario has been established. If the worst-case parameters include a horizontal release, vertical release with a rain cap, volume or area source, IES will consult with the Department's modeling staff.

### 5.3 Elevation Data

United States Geological Survey (USGS) Digital Elevation Model (DEM) files will be imported to determine elevations. 7½-minute DEMs with a resolution of 30 meters will be used. Based on the size of the proposed receptor grid, the Post Falls, Idaho and Liberty Lake, Washington-Idaho quadrangle DEM files will be used. Copies of the actual DEM data used in the analysis can be provided with the modeling report.

## 6.0 TECHNICAL REPORT

A technical report will be prepared and included as a section with the FEC application discussing the results of the air dispersion analysis. This report will include the following information:

- Introduction/Background – including purpose of modeling analysis
- Discussion of Methodology – including justification for model
- Input Parameters – including source input data, building downwash information, receptor locations, and meteorological data in electronic format.
- Results of Ambient Impact Analysis – including maximum off-site concentrations, and comparisons with the AAC or NAAQSs. Copies of the model input and output files will also be included in electronic format.

We greatly appreciate your efforts in expediting review of this protocol. Please do not hesitate to contact Bob Schlosser or me if you should have any questions.

Sincerely,

Marjorie J. Fitzpatrick /e/
Marjorie J. Fitzpatrick, QEP
Principal Project Manager

cc: W. Rogers, DEQ
J. Pettit, DEQ
S. Sonde, Biopol
M. Sawatzky, Biopol
E. Tannebaum, IPS
E. Flagg, IPS
R. Schlosser, IES
A. Soni, IES

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 NORTH HILTON, BOISE, ID 83706 · (208) 373-0502

C. L. "BUTCH" OTTER, GOVERNOR
TONI HARDESTY, DIRECTOR

March 27, 2007

Marjorie J. Fitzpatrick
IES Engineers
Blue Bell, PA

RE: Modeling Protocol for the Biopol Laboratory, Inc. Facility Located in Post Falls, Idaho

Marjorie:

DEQ received your dispersion modeling protocol on March 21, 2007. The modeling protocol was submitted on behalf of Biopol Laboratory, Inc. The modeling protocol proposes methods and data for use in the ambient impact analyses of a Permit to Construct application, utilizing a Facility Emissions Cap (FEC), for a new allergen purification facility in Post Falls, Idaho.

The modeling protocol has been reviewed and DEQ has the following comments:

- Comment 1: DEQ modeling staff utilizes two types of modeling thresholds. The first is an emissions level below which modeling is rarely needed. If facility-wide emissions will remain below these levels, modeling is not necessary, even for a FEC permit. These thresholds are as follows: CO = 14 pounds per hour; NOx = 1 ton per year; SO2 = 1 ton per year and 0.2 pounds per hour; PM10 = 1 ton per year and 0.2 pounds per hour; lead = 100 pounds per month. The second level of modeling thresholds identifies emissions rates below which modeling is typically not required; however, DEQ will make the determination on a case-by-case basis considering the characteristics of the release the potentially exposed public. These threshold levels are as follows: CO = 70 pounds per hour; NOx = 7 ton per year; SO2 = 7 ton per year and 0.9 pounds per hour; PM10 = 7 ton per year and 0.9 pounds per hour. For most FEC permits, modeling should be conducted if emissions are greater than the first-level threshold and les than the second-level threshold.

  The modeler should compare the thresholds to the projected emissions to generally govern the refinement of the analyses needed to demonstrate compliance for a FEC permit. For emissions substantially above the thresholds, especially if resulting modeled impacts are near applicable air quality standards, the FEC modeling analysis should thoroughly evaluate potential scenarios for operational variability and future growth, evaluating multiple scenarios of stack configurations and/or potential building configurations. If emissions are only slightly greater than first-level thresholds, then a more simplistic approach may be adequate.

- Comment 2: The application should provide documentation and justification for stack parameters used in the modeling analyses, clearly showing how stack gas temperatures and flow rates were estimated. In most instances, applicants should use typical parameters, not maximum temperatures and flow rates.

- Comment 3: Spokane, Washington meteorological data are the most representative of reasonably available, processed data, although these data are of questionable representativeness for conditions in Post Falls, Idaho. To account for this greater uncertainty, modeled impacts (before inclusion of a background concentration) should be increased by 20 percent. If compliance cannot be demonstrated with this increase, DEQ dispersion modeling staff should be consulted to evaluate potential alternative methods.

- Comment 4: The proposed receptor grid appears reasonable. However, it is the applicant's responsibility to use a sufficiently tight receptor network such that the maximum modeled concentration is reasonably resolved. If DEQ conducts verification modeling analyses with a tighter receptor grid and compliance with standards is no longer demonstrated, the permit will be denied.

- Comment 5: When modeling carcinogenic TAPs (IDAPA 58.01.01.586), the applicant may use a 5-year meteorological data set, using the period average concentration, rather than five separate 1-year data sets. When modeling for short-term PM10 standard compliance the applicant may use a 5-year combined data set and use the maximum 6$^{th}$ high modeled concentration, rather than using the maximum 2$^{nd}$ high of each year modeled separately.

- Comment 6: A PM10 background concentration of 67 $\mu g/m^3$ for the 24-hour averaging period and 23.7 $\mu g/m^3$ for the annual averaging period is based on Post Falls monitoring data. For other criteria pollutants DEQ determined default background concentrations for small town/suburban areas are most appropriate for the Post Falls areal: CO 1-hr = 10,200 $\mu g/m^3$; CO 8-hr = 3,400 $\mu g/m^3$; $NO_2$ annual = 32 $\mu g/m^3$; $SO_2$ 3-hr = 42 $\mu g/m^3$; $SO_2$ 24-hr = 26 $\mu g/m^3$; $SO_2$ annual = 8 $\mu g/m^3$; Pb quarterly = 0.03 $\mu g/m^3$.

- Comment 7: No co-contributing sources were identified by DEQ in the area where the proposed facility will be located.

- Comment 8: Attached are Spokane meteorological files as processed through AERMET.

DEQ's modeling staff considers the submitted dispersion modeling protocol, with resolution of the additional items noted above, to be approved. It should be noted, however, that the approval of this modeling protocol is not meant to imply approval of a completed dispersion modeling analysis. Please refer to the *State of Idaho Air Quality Modeling Guideline*, which is available on the Internet at http://www.deq.state.id.us/air/permits_forms/permitting/modeling_guideline.pdf, for further guidance.

To ensure a complete and timely review of the final analysis, our modeling staff requests that electronic copies of all modeling input and output files (including BPIP, raw meteorological data files, AERMET input and output files, and AERMAP input and output files) are submitted with an analysis report. If DEQ provided model-ready meteorological data files, then these do not need to be resubmitted to DEQ with the application. If you have any further questions or comments, please contact me at (208) 373-0112.

Sincerely,

Kevin Schilling
Stationary Source Air Modeling Coordinator
Idaho Department of Environmental Quality
208 373-0112

## Quintiliano, Sharon

**From:** Fitzpatrick, Marjorie
**Sent:** Tuesday, April 17, 2007 10:14 AM
**To:** Quintiliano, Sharon
**Subject:** FW: Biopol Issue with DEM Imports (EHS07308.01)

Marj Fitzpatrick, QEP
IES Engineers
1720 Walton Road
Blue Bell, PA 19422
610-828-3078
Fax: 610-828-7842
mfitzpatrick@iesengineers.com

-----Original Message-----
**From:** Kevin.Schilling@deq.idaho.gov [mailto:Kevin.Schilling@deq.idaho.gov]
**Sent:** Tuesday, April 03, 2007 6:18 PM
**To:** MFITZPATRICK@iesengineers.com
**Subject:** RE: Biopol Issue with DEM Imports (EHS07308.01)

Marjorie,

I opened your model input file a looked over things from the standpoint of how fast the model will run. I think the main issue is the 14,000 receptors. I would recommend you use multiple grid spacing within the same run. At locations along the property line out to about 50 meters you may want to use 10 - 25 meter spacing, but after you get out over 200 meters, you could probably go 100 meter spacing; and you could probably go to something like 500 meter spacing out beyond 1500 meters.

I'm still looking into the dem problem.

Kevin

---

**From:** Fitzpatrick, Marjorie [mailto:MFITZPATRICK@iesengineers.com]
**Sent:** Monday, April 02, 2007 1:05 PM
**To:** Kevin Schilling
**Cc:** Schlosser, Robert; Maye, Christopher
**Subject:** FW: Biopol Issue with DEM Imports (EHS07308.01)

As you requested, we are forwarding the issue we are having with the Biopol DEM files. Since we spoke, I found out that we also sent an e-mail to EPA to see if they have any thoughts on this as well. Since we are expecting the max at or near the property line, the unreasonable rise in elevation doesn't seem like something we want in the model runs.

If this isn't resolved in the next day, we will take you up on your suggestion of just running it in flat terrain. If we end up doing that, I'll send you an e-mail as a way to "document" our change in approach from the approved protocol.

Thanks for your assistance.

Marj Fitzpatrick, QEP
IES Engineers
1720 Walton Road
Blue Bell, PA 19422
610-828-3078
Fax: 610-828-7842
mfitzpatrick@iesengineers.com
-----Original Message-----
**From:** Maye, Christopher
**Sent:** Friday, March 30, 2007 5:04 PM
**To:** support@trinityconsultants.com
**Cc:** Fitzpatrick, Marjorie
**Subject:**

Please Help:

I just called this request in at about 4:30 PM today.

The problem I am having is that I am getting abnormally high Height Scale values when I import the dem elevation data using AERMAP for the entire receptor grid.

Things I have tried:
I initially tried to import just the boundary receptors with the dem that surrounds the facility (8270 dem file). That yielded reasonable results.

I then tried a small discrete receptor grid that slightly extended into the dem file immediately east of the 8270 dem file, and the height scale appeared to give reasonable results.

However, when I tried to import the entire grid elevations, the height scales looked abnormally high in bands of receptors (as scrolling down in table view). I tried obtaining the dems from different sources (webgis.com first, then went to data.geocomm.com to determine if the problem was with the original dem, but had the same result.

Please let me know if you find anything that may help me resolve the problem.

I can be reached at this email address, and by phone at 610-828-3078, extension 302.

Thanks so much for your help,

Chris Maye
Senior Project Engineer
IES Engineers

APPENDIX 3-B

FACILITY SITE PLAN

SEE ORIGINAL
APPLICATION
FOR PLOT PLAN

APPENDIX 3-C

DEPARTMENT'S APPENDIX C FORM

**Idaho DEQ Air Dispersion Modeling Checklist**

As a requirement of the air permitting process, an air dispersion modeling analysis (screening and/or refined) must be conducted. Air dispersion models are used to predict the potential impact a source may have on the air shed in which it is located. This checklist will aid in collecting all of the necessary information to perform a complete modeling analysis. The EPA's *Guideline on Air Quality Models* (EPA 2001) and this guideline should be used as a reference to ensure that the modeling techniques used will meet federal and state requirements. Please include sufficient computer disk copies of the DOS versions of input and output files so DEQ can reproduce model runs. DEQ must be able to rerun the input files on the DOS versions of the models. Copies of the meteorological data files used and all building information must also be included. A scaled plot plan showing the location of all structures and emission points needs to be submitted as part of the permitting application. It is strongly recommended that the facility contact the DEQ modeling coordinator prior to performing an air quality assessment to negotiate a modeling protocol. Units must be noted where appropriate, both English and metric units are acceptable.

It is important that the **most recent model versions** be utilized in any analysis.

1. Name of Applicant/Company:

   ALK-Abelló Source Material, Inc.

   Facility Description:

   Facility will purify allergens for subsequent production of vaccines at other locations.

   Dispersion Model(s) Used:

   AERMOD

2. Source Classification:

| | $PM_{10}$ | $NO_x$ | PCE |
|---|---|---|---|
| Number of Point Sources (Section 3) | 16 | 3 | 0 |
| Number of Area Sources (Section 4) | 0 | 0 | 0 |
| Number of Volume Sources (Section 5) | 0 | 0 | 1 |

3. Stack/Point Source Parameters (please include for each stack/point source modeled). List the **maximum** emissions rate(s) for each pollutant. NOTE: If the stack is not circular, use equivalent dimensions determined by AREA = $\pi d^2/4$, where d is the inner stack diameter. Units must be noted where appropriate, both English and metric units are acceptable. (Note: $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers)

Source SRC 1

$PM_{10}$ 0.2 lb/hr $PM_{2.5}$ ______ $NO_x$ 1.2 lb/hr $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Stack Height 35.4 ft. Stack Diameter 1.33 ft. Stack Temperature 405 °F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 3,471 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

---

Source SRC 5

$PM_{10}$ 0.02 lb/hr $PM_{2.5}$ ______ $NO_x$ 0.12 lb/hr $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Stack Height 35.4 ft. Stack Diameter 0.5 ft. Stack Temperature 394 °F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 491 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

---

Source SRC 6

$PM_{10}$ 0.44 lb/hr $PM_{2.5}$ ______ $NO_x$ 12.36 lb/hr $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Stack Height 12 ft Stack Diameter 1 ft. Stack Temperature 975 °F

Stack Exit Velocity 9,900 ft/min and/or Actual Stack Flow Rate 7,772 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

3. Stack/Point Source Parameters (please include for each stack/point source modeled). List the **maximum** emissions rate(s) for each pollutant. NOTE: If the stack is not circular, use equivalent dimensions determined by AREA = $\pi d^2/4$, where d is the inner stack diameter. Units must be noted where appropriate, both English and metric units are acceptable. (Note: $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers)

Source EF 2-1

$PM_{10}$ 0.0831 lb/hr $PM_{2.5}$ ______ $NO_x$ ______ $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Stack Height 40 ft. Stack Diameter 1 ft. Stack Temperature 70°F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 1,963 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

---

Source EF 3-1

$PM_{10}$ 0.5841 lb/hr $PM_{2.5}$ ______ $NO_x$ ______ $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Stack Height 40 ft Stack Diameter 2 ft. Stack Temperature 70 °F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 7,850 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

---

Source EF 4-1

$PM_{10}$ 0.2691 lb/hr $PM_{2.5}$ ______ $NO_x$ ______ $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Stack Height 40 ft. Stack Diameter 2.4 ft. Stack Temperature 70 °F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 11,304 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

3. Stack/Point Source Parameters (please include for each stack/point source modeled). List the **maximum** emissions rate(s) for each pollutant. NOTE: If the stack is not circular, use equivalent dimensions determined by AREA = $\pi d^2/4$, where d is the inner stack diameter. Units must be noted where appropriate, both English and metric units are acceptable. (Note: $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers)

Source EF 3-4

$PM_{10}$ 0.0429 lb/hr $PM_{2.5}$ ____ $NO_x$ ____ $SO_2$ ____ CO ____ VOC ____

Toxic(s) (Please List): ____

Stack Height 40 ft. Stack Diameter 0.75 ft. Stack Temperature 70 °F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 1,104 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

---

Source EF - VAC

$PM_{10}$ 0.0429 lb/hr $PM_{2.5}$ ____ $NO_x$ ____ $SO_2$ ____ CO ____ VOC ____

Toxic(s) (Please List): ____

Stack Height 10 ft. Stack Diameter 0.5 ft. Stack Temperature 70 °F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 491 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

---

Source EF 9-1

$PM_{10}$ .2422 lb/hr $PM_{2.5}$ ____ $NO_x$ ____ $SO_2$ ____ CO ____ VOC ____

Toxic(s) (Please List): ____

Stack Height 30.4 ft. Stack Diameter 1.7 ft. Stack Temperature 70 °F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 5,672 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

3. Stack/Point Source Parameters (please include for each stack/point source modeled). List the **maximum** emissions rate(s) for each pollutant. NOTE: If the stack is not circular, use equivalent dimensions determined by AREA = $\pi d^2/4$, where d is the inner stack diameter. Units must be noted where appropriate, both English and metric units are acceptable. (Note: $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers)

Source SRC 24

$PM_{10}$ 0.110 lb/hr $PM_{2.5}$ ______ $NO_x$ ______ $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Stack Height 30.4 ft. Stack Diameter 0.8 ft. Stack Temperature 70 °F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 1,256 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

---

Source EF SMDMY

$PM_{10}$ 0.0253 lb/hr $PM_{2.5}$ ______ $NO_x$ ______ $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Stack Height 30.4 ft. Stack Diameter 0.39 ft. Stack Temperature 100° F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 298 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

---

Source SRC 26

$PM_{10}$ 0.260 lb/hr $PM_{2.5}$ ______ $NO_x$ ______ $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Stack Height 30.4 ft. Stack Diameter 1.2 ft. Stack Temperature 70 °F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 2,826 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

3. Stack/Point Source Parameters (please include for each stack/point source modeled). List the **maximum** emissions rate(s) for each pollutant. NOTE: If the stack is not circular, use equivalent dimensions determined by AREA = $\pi d^2/4$, where d is the inner stack diameter. Units must be noted where appropriate, both English and metric units are acceptable. (Note: $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers)

Source SRC 27

$PM_{10}$ 0.215 lb/hr $PM_{2.5}$ ____ $NO_x$ ____ $SO_2$ ____ CO ____ VOC ____

Toxic(s) (Please List): ____

Stack Height 30.4 ft. Stack Diameter 1.6 ft. Stack Temperature 100°F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 5,024 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

---

Source SRC 29

$PM_{10}$ 0.040 lb/hr $PM_{2.5}$ ____ $NO_x$ ____ $SO_2$ ____ CO ____ VOC ____

Toxic(s) (Please List): ____

Stack Height 30.4 ft. Stack Diameter 0.6 ft. Stack Temperature 70 °F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 707 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

---

Source SRC 30

$PM_{10}$ 0.215 lb/hr $PM_{2.5}$ ____ $NO_x$ ____ $SO_2$ ____ CO ____ VOC ____

Toxic(s) (Please List): ____

Stack Height 30.4 ft. Stack Diameter 1.6 ft. Stack Temperature 100°F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 5,024 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

3. Stack/Point Source Parameters (please include for each stack/point source modeled). List the **maximum** emissions rate(s) for each pollutant. NOTE: If the stack is not circular, use equivalent dimensions determined by AREA = $\pi d^2/4$, where d is the inner stack diameter. Units must be noted where appropriate, both English and metric units are acceptable. (Note: $PM_{2.5}$ refers to particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers)

Source SRC 32

$PM_{10}$ 0.040 lb/hr $PM_{2.5}$ ______ $NO_x$ ______ $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Stack Height 30.4 ft. Stack Diameter 0.6 Stack Temperature 70 °F

Stack Exit Velocity 2,500 ft/min and/or Actual Stack Flow Rate 707 acfm

Stack Orientation (Horizontal or Vertical) Vertical Rain Cap Present (Y or N) N

---

Source ______

$PM_{10}$ ______ $PM_{2.5}$ ______ $NO_x$ ______ $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Stack Height ______ Stack Diameter ______ Stack Temperature ______

Stack Exit Velocity ______ and/or Actual Stack Flow Rate ______

Stack Orientation (Horizontal or Vertical) ______ Rain Cap Present (Y or N) ______

---

Source ______

$PM_{10}$ ______ $PM_{2.5}$ ______ $NO_x$ ______ $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Stack Height ______ Stack Diameter ______ Stack Temperature ______

Stack Exit Velocity ______ and/or Actual Stack Flow Rate ______

Stack Orientation (Horizontal or Vertical) ______ Rain Cap Present (Y or N) ______

4. Area Source Parameters (please include for each area source modeled). List the **maximum** emissions rate(s) for each pollutant. Units must be noted where appropriate, both English and metric units are acceptable.

Source________________ Not Applicable

$PM_{10}$ __________ $PM_{2.5}$ __________ $NO_x$ __________ $SO_2$ __________ CO__________ VOC __________

Toxic(s) (Please List):__________________________________________

Source Height __________ Easterly Dimension __________________ Northerly Dimension ________________

Initial Vertical Dimension ____________________________ Angle from North ____________________

---

Source________________

$PM_{10}$ __________ $PM_{2.5}$ __________ $NO_x$ __________ $SO_2$ __________ CO__________ VOC __________

Toxic(s) (Please List):__________________________________________

Source Height __________ Easterly Dimension __________________ Northerly Dimension ________________

Initial Vertical Dimension ____________________________ Angle from North ____________________

---

Source________________

$PM_{10}$ __________ $PM_{2.5}$ __________ $NO_x$ __________ $SO_2$ __________ CO__________ VOC __________

Toxic(s) (Please List):__________________________________________

Source Height __________ Easterly Dimension __________________ Northerly Dimension ________________

Initial Vertical Dimension ____________________________ Angle from North ____________________

---

Source________________

$PM_{10}$ __________ $PM_{2.5}$ __________ $NO_x$ __________ $SO_2$ __________ CO__________ VOC __________

Toxic(s) (Please List):__________________________________________

Source Height __________ Easterly Dimension __________________ Northerly Dimension ________________

Initial Vertical Dimension ____________________________ Angle from North ____________________

5. Volume Source Parameters (please include for each volume source modeled). List the **maximum** emissions rate(s) for each pollutant. Units must be noted where appropriate, both English and metric units are acceptable.

Source SRC 40

$PM_{10}$ ______ $PM_{2.5}$ ______ $NO_x$ ______ $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): Perchloroethylene - 0.16 tpy

Source Height 20 ft. Initial Horizontal Dimension 26.6 ft.

Initial Vertical Dimension 9.2 ft.

---

Source ______

$PM_{10}$ ______ $PM_{2.5}$ ______ $NO_x$ ______ $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Source Height ______ Initial Horizontal Dimension ______

Initial Vertical Dimension ______

---

Source ______

$PM_{10}$ ______ $PM_{2.5}$ ______ $NO_x$ ______ $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Source Height ______ Initial Horizontal Dimension ______

Initial Vertical Dimension ______

---

Source ______

$PM_{10}$ ______ $PM_{2.5}$ ______ $NO_x$ ______ $SO_2$ ______ CO ______ VOC ______

Toxic(s) (Please List): ______

Source Height ______ Initial Horizontal Dimension ______

Initial Vertical Dimension ______

6. Structure Parameters: **(Applies to any and all structures within the property boundary(ies) as well as nearby structures that may influence the dispersion of pollutants emitted by the source(s)).** Units must be noted where appropriate, both English and metric units are acceptable.

All Building Dimensions are in Feet.

Building Main Building

Building Tier No. 1 Height: 29 Building Tier No. 1 Length: 223 Building Tier No. 1 Width: 115

Building Tier No. 2 Height: ______ Building Tier No. 2 Length: ______ Building Tier No. 2 Width: ______

Building Tier No. 3 Height: ______ Building Tier No. 3 Length: ______ Building Tier No. 3 Width: ______

---

Building Utilities Section

Building Tier No. 1 Height: 25 Building Tier No. 1 Length: 135 Building Tier No. 1 Width: 50

Building Tier No. 2 Height: ______ Building Tier No. 2 Length: ______ Building Tier No. 2 Width: ______

Building Tier No. 3 Height: ______ Building Tier No. 3 Length: ______ Building Tier No. 3 Width: ______

---

Building Timothy Pollen Section

Building Tier No. 1 Height: 25 Building Tier No. 1 Length: 135 Building Tier No. 1 Width: 28

Building Tier No. 2 Height: ______ Building Tier No. 2 Length: ______ Building Tier No. 2 Width: ______

Building Tier No. 3 Height: ______ Building Tier No. 3 Length: ______ Building Tier No. 3 Width: ______

---

Building Shell Space

Building Tier No. 1 Height: 25 Building Tier No. 1 Length: 223 Building Tier No. 1 Width: 92

Building Tier No. 2 Height: ______ Building Tier No. 2 Length: ______ Building Tier No. 2 Width: ______

Building Tier No. 3 Height: ______ Building Tier No. 3 Length: ______ Building Tier No. 3 Width: ______

---

Tank N/A Tank Height ______ Tank Diameter ______

Tank ______ Tank Height ______ Tank Diameter ______

Tank ______ Tank Height ______ Tank Diameter ______

Tank ______ Tank Height ______ Tank Diameter ______

6. Structure Parameters: **(Applies to any and all structures within the property boundary(ies) as well as nearby structures that may influence the dispersion of pollutants emitted by the source(s)).** Units must be noted where appropriate, both English and metric units are acceptable.

All Building Dimensions are in Feet.

Building Future Space

Building Tier No. 1 Height: 25 Building Tier No. 1 Length: 223 Building Tier No. 1 Width: 60

Building Tier No. 2 Height: ______ Building Tier No. 2 Length: ______ Building Tier No. 2 Width: ______

Building Tier No. 3 Height: ______ Building Tier No. 3 Length: ______ Building Tier No. 3 Width: ______

---

Building ____________________

Building Tier No. 1 Height: ______ Building Tier No. 1 Length: ______ Building Tier No. 1 Width: ______

Building Tier No. 2 Height: ______ Building Tier No. 2 Length: ______ Building Tier No. 2 Width: ______

Building Tier No. 3 Height: ______ Building Tier No. 3 Length: ______ Building Tier No. 3 Width: ______

---

Building ____________________

Building Tier No. 1 Height: ______ Building Tier No. 1 Length: ______ Building Tier No. 1 Width: ______

Building Tier No. 2 Height: ______ Building Tier No. 2 Length: ______ Building Tier No. 2 Width: ______

Building Tier No. 3 Height: ______ Building Tier No. 3 Length: ______ Building Tier No. 3 Width: ______

---

Building ____________________

Building Tier No. 1 Height: ______ Building Tier No. 1 Length: ______ Building Tier No. 1 Width: ______

Building Tier No. 2 Height: ______ Building Tier No. 2 Length: ______ Building Tier No. 2 Width: ______

Building Tier No. 3 Height: ______ Building Tier No. 3 Length: ______ Building Tier No. 3 Width: ______

---

Tank NA　　Tank Height ______　　Tank Diameter ______

Tank ______　　Tank Height ______　　Tank Diameter ______

Tank ______　　Tank Height ______　　Tank Diameter ______

Tank ______　　Tank Height ______　　Tank Diameter ______

7. Scaled Plot Plan: (Make sure that all of the buildings and tanks shown on the scaled plot plan are also listed in section 6.)

Emission Release Locations:_____ Buildings: on-site-only (On site and neighboring) Tanks: on-site-only (On site and neighboring)

Property Boundary(ies):_________ Potential Co-contributor(s):_________

Sensitive Receptors:_________

Note: A sensitive receptor is defined in IDAPA 58.01.01.007.10 as, "any residence, building, or location occupied or frequented by persons who, due to age, infirmity, or health-based criteria, may be more susceptible to the deleterious effects of a toxic air pollutant than the general population including, but not limited to, elementary and secondary schools, day care centers, playgrounds and parks, hospitals, clinics, and nursing homes".

8. Topographic Map Showing: NA - Aermod used; however, a topographic map is provided in Attachment 3-D.

Source Location(s) _____ Buildings _________ (On site and neighboring) Tanks _______ (On site and neighboring)

Property Boundary(ies) _________ Model Receptors _______

Maximum Impact Locations______

9. Meteorology Used (upper air and surface data):

Site-Specific: Data provided by DEQ for 1987 - 91

A quality control and quality assurance analysis, consistent with EPA guidelines, should be included for any on-site data used other than that supplied by the NWS. Contact DEQ regarding the adequacy of this data before use.

NWS Data Representative of the Site _________________

10. Land Use Classification:

Urban ________ Rural X (DEQ can be contacted for further guidance on source classification)

Justification:

Review of USGS topographic map of area.

**Completeness Determination Questions:**

- Was a modeling protocol approved by DEQ prior to permit application? Negotiating a modeling protocol with DEQ assures the general modeling approach will be accepted. Yes

- Is a justification given explaining why a particular dispersion model was used? Yes

- Did you document and justify input parameters and model settings? (Please include a written justification.) Yes

- Were grid receptors placed 100 to 500 meters apart for the initial modeling analysis in order to find the area of maximum impact? Yes

- Were grid receptors placed 25 to 50 meters apart in the area of maximum impact? Yes

- What ambient air quality standards apply (e.g., NAAQS, significance standards, acceptable ambient concentration for carcinogens and non-carcinogens (AACC, AAC, respectively), PSD increment standards)? TAP for perchloroethylene -- 2.1 $\mu g/m^3$ NAAQS for $PM_{10}$, $NO_x$

- Were DEQ-approved background concentrations included in the modeling analysis (attainment and unclassified areas only)? Yes

**Considerations for major pollution sources and sources subject to PSD regulations:** NA

- Was DEQ contacted regarding the need for (and quality control of ) pre-construction monitoring data?

- Was a visibility analysis performed?

- Was the area of significant impact documented?

- Were impacts included (on disk) at all integral UTM coordinates within the significant impact area?

- If a major facility (as defined in IDAPA 58.01.01.006.55), was cumulative increment consumption analyzed?

Signature of modeler (please print and sign name) Marjorie J. Fitzpatrick

Marjorie J. Fitzpatrick, QEP

Telephone Number 610-828-3078

Name of DEQ Modeling Contact Kevin Schilling

Telephone Number (208) 373-0502

APPENDIX 3-D

ELECTRONIC DATA FILES

ENGINEERS

ATTACHMENT 4

UPDATED EMISSION CALCULATIONS

## ATTACHMENT 4
## EMISSION CALCULATIONS

Emissions of regulated (criteria and toxic) air pollutants from each source or source group are calculated below. Potential emissions represent the maximum theoretical emissions that would occur if the source was operated at its full capacity on a continuous basis (8,760 hours per year). Actual emissions represent the expected baseline emissions, which reflect the actual operating level and schedule of each source. These emissions are different from the modeled emissions (see Attachment 3) that were used in establishing the respective facility emission caps.

**BOILERS – Source Nos. SRC-1 and SRC-5**

The facility will include four 125-hp, fire-tube, natural gas-fired boilers and one 50-hp fire-tube, natural gas-fired boiler, all equipped with low-$NO_x$ burners. Two of the 125-hp boilers will be installed during the initial construction phase, with the other two 125-hp boilers and the 50-hp boiler being added in the future.

Emissions are calculated using emission factors in the EPA publication, AP-42, A Compilation of Air Pollutant Emission Factors, 5th Edition, Volume I, Section 1.4, Natural Gas Combustion:

| | |
|---|---|
| $NO_x$ | 50 lb/$10^6$ cf natural gas |
| CO | 84 lb/$10^6$ cf natural gas |
| $SO_x$ | 0.6 lb/$10^6$ cf natural gas |
| PM | 7.6 lb/$10^6$ cf natural gas |
| VOC | 5.5 lb/$10^6$ cf natural gas |

Hourly and annual emissions are summarized in the spreadsheet on the following page.

**Actual Emissions**

Actual emissions reflect the fact that the boilers will not operate around the clock at maximum capacity. In reality, no more than two of the boilers will operate at any time; the third boiler will serve as a standby unit. For purposes of calculating actual emissions, ALK-Abello assumes the following boiler operations:

- Maximum hourly emissions – three of the 125-hp boilers operating at maximum capacity
- Annual emissions – three of the 125-hp boilers operating at the equivalent of maximum capacity for 2,000 hr/yr

Maximum Actual Hourly Emissions:

$NO_x$ 50 lb/$10^6$ cf x 5,952 cf/hr x 3 boilers = 0.89 lb/hr
CO 84 lb/$10^6$ cf x 5,952 cf/hr x 3 boilers = 1.50 lb/hr
$SO_x$ 0.6 lb/$10^6$ cf x 5,952 cf/hr x 3 boilers = 0.01 lb/hr
PM 7.6 lb/$10^6$ cf x 5,952 cf/hr x 3 boilers = 0.14 lb/hr
VOC 5.5 lb/$10^6$ cf x 5,952 cf/hr x 3 boilers = 0.10 lb/hr

Actual Annual Emissions:

$NO_x$ 0.89 lb/hr x 2,000 hr/yr x 1 ton/2,000 lb = 0.89 ton/yr
CO 1.50 lb/hr x 2,000 hr/yr x 1 ton/2,000 lb = 1.50 ton/yr
$SO_x$ 0.01 lb/hr x 2,000 hr/yr x 1 ton/2,000 lb = 0.01 ton/yr
PM 0.14 lb/hr x 2,000 hr/yr x 1 ton/2,000 lb = 0.14 ton/yr
VOC 0.10 lb/hr x 2,000 hr/yr x 1 ton/2,000 lb = 0.10 ton/yr

**ELECTRIC GENERATOR – Source No. CU-3**

The electric generator is rated at 1,000 kW (1 MW), which is equivalent to 1,382 brake horsepower (bhp). It will fire diesel fuel at a rate of 100 gal/hr. $SO_x$ emissions are calculated using the NSPS regulatory limit of 500 ppm. $NO_x$, non-methane hydrocarbons (NMHC), CO, and PM emissions are based on the allowable limits established in the New Source Performance Standard for Stationary Compression Ignition Internal Combustion Engines (40 CFR 60, Subpart IIII):

| | |
|---|---|
| $NO_x$ + NMHC | 6.4 gm/kW-hr[a] |
| CO | 3.5 gm/kW-hr |
| PM | 0.2 gm/kW-hr |

[a] It is assumed that $NO_x$ represents 88 percent of the total (5.61 gm/kW-hr) and NMHC represents 12 percent of the total (0.79 gm/kW-hr). These fractions are derived from the EPA Tier 1 standards for each pollutant.

**Potential Emissions**

The engine will serve strictly as an emergency power source. The modeling analysis presented in Attachment 3 is based on a maximum of 500 hours of operation per year, which includes weekly readiness testing for approximately one hour and emergency operation. The potential emissions are presented in the following spreadsheet, which also lists the boiler emissions.

Client: Biopol Laboratory, Inc.
Project Name: New Post Falls Facility
Project No.: EHS07308.01
Filename: L:\Projects\IPS\Biopol\308\EHS08308.08\Final 111408\[Combustion Equipment Emisson Inventory 03302007Rev2.XLS]Sheet1

| Preliminary Mechanical Equipment List | | | | | | | EMISSION FACTORS | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equip. Tag | Bldg | Location | Service | Description | CAPACITY | CAPACITY UNITS | NOx | Units | Reference | CO | Units | Reference | PM10 | Units | Reference | VOC | Units | Reference | SOx | Units | Reference |
| ~~AHU-1~~ | ~~USM~~ | ~~Roof~~ | ~~USM Inoculation Area~~ | ~~1,500 CFM (3 HP), 5.8 Tons, 66 MBH, 100% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system~~ | ~~66,000~~ | ~~Btu/hr~~ | ~~50~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~84.0~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~7.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~5.5~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~0.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ |
| ~~AHU-2~~ | ~~USM~~ | ~~Roof~~ | ~~USM Process/Support~~ | ~~4,250 CFM (7-1/2 HP SF / 3 HP RF), 11.5 Tons, 55 MBH, 50% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system~~ | ~~55,000~~ | ~~Btu/hr~~ | ~~50~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~84.0~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~7.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~5.5~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~0.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ |
| ~~AHU-3~~ | ~~SSM~~ | ~~Roof~~ | ~~SSM Pollen Lab~~ | ~~24,600 CFM (40 HP SF / 15 HP RF), 101.2 Tons, 723 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system~~ | ~~723,000~~ | ~~Btu/hr~~ | ~~50~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~84.0~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~7.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~5.5~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~0.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ |
| ~~AHU-4~~ | ~~USM~~ | ~~Roof~~ | ~~Prod Dev / QC Labs~~ | ~~20,000 CFM (40 HP SF / 15 HP RF), 67.5 Tons, 828 MBH, 80% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system~~ | ~~828,000~~ | ~~Btu/hr~~ | ~~50~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~84.0~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~7.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~5.5~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~0.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ |
| ~~AHU-6~~ | ~~ADM~~ | ~~Roof~~ | ~~Administration~~ | ~~15,000 CFM (25 HP supply, 7-1/2 HP return), 39 Tons, 84 MBH, 40% OA, DX packaged rooftop AHU, packaged controls for system~~ | ~~84,000~~ | ~~Btu/hr~~ | ~~50~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~84.0~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~7.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~5.5~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~0.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ |
| | | | | | | | | | | | | | | | | | | | | | |
| ~~AHU-7~~ | | ~~Roof~~ | ~~Timothy Pollen~~ | ~~21,000 CFM (40 HP SF / 15 HP RF), 86.7 Tons, 610 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system (Future)~~ | ~~610,000~~ | ~~Btu/hr~~ | ~~50~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~84.0~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~7.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~5.5~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~0.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ |
| ~~AHU-8~~ | | ~~Roof~~ | ~~Ragweed~~ | ~~21,000 CFM (40 HP SF / 15 HP RF), 86.7 Tons, 610 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system (Future)~~ | ~~610,000~~ | ~~Btu/hr~~ | ~~50~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~84.0~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~7.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~5.5~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~0.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ |
| ~~AHU-9~~ | | ~~Roof~~ | ~~Birch~~ | ~~21,000 CFM (40 HP SF / 15 HP RF), 86.7 Tons, 610 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system (Future)~~ | ~~610,000~~ | ~~Btu/hr~~ | ~~50~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~84.0~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~7.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~5.5~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~0.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ |
| | | | | | | | | | | | | | | | | | | | | | |
| ~~AHU-10~~ | | ~~Roof~~ | ~~Spanish Misc~~ | ~~24,250 CFM (40 HP SF), 93.1 Tons, 1060 MBH, 100% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system (Future)~~ | ~~1,060,000~~ | ~~Btu/hr~~ | ~~50~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~84.0~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~7.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~5.5~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~0.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ |
| ~~AHU-11~~ | | ~~Roof~~ | ~~SSM Expansion~~ | ~~24,500 CFM (40 HP SF / 15 HP RF), 101.2 Tons, 723 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system (Future)~~ | ~~723,000~~ | ~~Btu/hr~~ | ~~50~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~84.0~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~7.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~5.5~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ | ~~0.6~~ | ~~lb/MMCF~~ | ~~USEPA, AP-42 Section 1.4, 07/98~~ |
| | | | | | | | | | | | | | | | | | | | | | |
| HB-1 (SRC 1) | CUP | 1st Flr | Heating Hot Water system | Natural gas-fired, fire-tube hot water boiler, 125 BHP | 6,250,000 | Btu/hr | 50 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 84.0 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 7.6 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 5.5 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 0.6 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 |
| HB-2 (SRC 1) | CUP | 1st Flr | Heating Hot Water system | Natural gas-fired, fire-tube hot water boiler, 125 BHP | 6,250,000 | Btu/hr | 50 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 84.0 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 7.6 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 5.5 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 0.6 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 |
| HB-3 (SRC 1) | CUP | 1st Flr | Heating Hot Water system | Natural gas-fired, fire-tube hot water boiler, 125 BHP (Future) | 6,250,000 | Btu/hr | 50 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 84.0 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 7.6 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 5.5 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 0.6 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 |
| HB-4 (SRC 1) | CUP | 1st Flr | Heating Hot Water system | Natural gas-fired, fire-tube hot water boiler, 125 BHP (Future) | 6,250,000 | Btu/hr | 50 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 84.0 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 7.6 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 5.5 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 0.6 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 |
| SB-1 | CUP | 1st Flr | Humidification | Electric, steam boiler, 45 BHP. (Existing) | | | | | | | | | | | | | | | | | |
| SRC 5 | CUP | 1st Flr | Humidification | Natural gas-fired, fire-tube steam boiler, 50 BHP (Future) | 2,500,000 | Btu/hr | 50 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 84.0 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 7.6 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 5.5 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 | 0.6 | lb/MMCF | USEPA, AP-42 Section 1.4, 07/98 |
| SRC 6 | | | | 1000 kW Generator | 1,000 | kW | 5.61 | g/kW-hr | 40 CFR §60.4205(b) | 3.5 | g/kW-hr | 40 CFR §60.4205(b) | 0.2 | g/kW-hr | 40 CFR §60.4205(b) | 0.79 | g/kW-hr | 40 CFR §60.4205(b) | 500 | ppm | 40 CFR §60.4207 |

[1] Natural Gas External Combustion is in SCF and IC Engine is gallons

Client: Biopol Laboratory, Inc.
Project Name: New Post Falls Facility
Project No.: EHS07308.01
Filename: L:\Projects\IPS\Biopol\308\EHS08308.08\Final 111408\[Combustion Equipment Emisson Inventory 03302007R

| Preliminary Mechanical Equipment List | | | | | Fuel Heating Value | Fuel Heating Value Units | Fuel Usage Per hour[1] | Operating Hrs per year | Fuel Usage Per Year[1] | EMISSIONS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | NOx | | CO | | PM10 | | VOC | | SOx | |
| Equip. Tag | Bldg | Location | Service | Description | | | | | | lbs/hr | tpy | lbs/hr | tpy | lbs/hr | tpy | lbs/hr | tpy | lbs/hr | tpy |
| ~~AHU-1~~ | ~~USM~~ | ~~Roof~~ | ~~USM Inoculation Area~~ | ~~1,500 CFM (2 HP), 5.8 Tons, 66 MBH, 100% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system~~ | ~~1050~~ | ~~Btu/SCF~~ | ~~63~~ | ~~8,760~~ | ~~551,880~~ | ~~0.0032~~ | ~~0.014~~ | ~~0.006~~ | ~~0.023~~ | ~~0.0005~~ | ~~0.002~~ | ~~0.0003~~ | ~~0.002~~ | ~~0.0000~~ | ~~0.000~~ |
| ~~AHU-2~~ | ~~USM~~ | ~~Roof~~ | ~~USM Process/Support~~ | ~~4,250 CFM (7 1/2 HP SF / 3 HP RF), 11.6 Tons, 66 MBH, 50% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system~~ | ~~1050~~ | ~~Btu/SCF~~ | ~~52~~ | ~~8,760~~ | ~~455,520~~ | ~~0.0026~~ | ~~0.014~~ | ~~0.004~~ | ~~0.010~~ | ~~0.0004~~ | ~~0.002~~ | ~~0.0003~~ | ~~0.001~~ | ~~0.0000~~ | ~~0.000~~ |
| ~~AHU-3~~ | ~~SSM~~ | ~~Roof~~ | ~~SSM Pollen Lab~~ | ~~24,500 CFM (40 HP SF / 15 HP RF), 101.2 Tons, 723 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system~~ | ~~1050~~ | ~~Btu/SCF~~ | ~~689~~ | ~~8,760~~ | ~~6,035,640~~ | ~~0.0345~~ | ~~0.151~~ | ~~0.058~~ | ~~0.253~~ | ~~0.0052~~ | ~~0.023~~ | ~~0.0038~~ | ~~0.017~~ | ~~0.0004~~ | ~~0.002~~ |
| ~~AHU-4~~ | ~~USM~~ | ~~Roof~~ | ~~Prod Dev / QC Labs~~ | ~~20,000 CFM (40 HP SF / 15 HP RF), 87.5 Tons, 628 MBH, 80% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system~~ | ~~1050~~ | ~~Btu/SCF~~ | ~~608~~ | ~~8,760~~ | ~~5,326,080~~ | ~~0.0270~~ | ~~0.121~~ | ~~0.050~~ | ~~0.220~~ | ~~0.0045~~ | ~~0.020~~ | ~~0.0033~~ | ~~0.014~~ | ~~0.0004~~ | ~~0.002~~ |
| ~~AHU-6~~ | ~~ADM~~ | ~~Roof~~ | ~~Administration~~ | ~~15,000 CFM (25 HP supply, 7 1/2 HP return), 38 Tons, 84 MBH, 40% OA, DX packaged rooftop AHU, packaged controls for system~~ | ~~1050~~ | ~~Btu/SCF~~ | ~~80~~ | ~~8,760~~ | ~~700,800~~ | ~~0.0040~~ | ~~0.010~~ | ~~0.007~~ | ~~0.020~~ | ~~0.0006~~ | ~~0.003~~ | ~~0.0004~~ | ~~0.002~~ | ~~0.0000~~ | ~~0.000~~ |
| | | | | | | | | | | ~~0.0743~~ | ~~0.3260~~ | ~~0.1240~~ | ~~0.4440~~ | ~~0.0443~~ | ~~0.0600~~ | ~~0.0084~~ | ~~0.0360~~ | ~~0.0009~~ | ~~0.0040~~ |
| ~~AHU-7~~ | | ~~Roof~~ | ~~Timothy Pollen~~ | ~~21,000 CFM (40 HP SF / 15 HP RF), 86.7 Tons, 610 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system (Future)~~ | ~~1050~~ | ~~Btu/SCF~~ | ~~590~~ | ~~8,760~~ | ~~5,168,400~~ | ~~0.0295~~ | ~~0.129~~ | ~~0.050~~ | ~~0.217~~ | ~~0.0045~~ | ~~0.020~~ | ~~0.0032~~ | ~~0.014~~ | ~~0.0004~~ | ~~0.002~~ |
| ~~AHU-8~~ | | ~~Roof~~ | ~~Ragweed~~ | ~~21,000 CFM (40 HP SF / 15 HP RF), 86.7 Tons, 610 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system (Future)~~ | ~~1050~~ | ~~Btu/SCF~~ | ~~590~~ | ~~8,760~~ | ~~5,168,400~~ | ~~0.0295~~ | ~~0.129~~ | ~~0.050~~ | ~~0.217~~ | ~~0.0045~~ | ~~0.020~~ | ~~0.0032~~ | ~~0.014~~ | ~~0.0004~~ | ~~0.002~~ |
| ~~AHU-9~~ | | ~~Roof~~ | ~~Birch~~ | ~~21,000 CFM (40 HP SF / 15 HP RF), 86.7 Tons, 610 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system (Future)~~ | ~~1050~~ | ~~Btu/SCF~~ | ~~590~~ | ~~8,760~~ | ~~5,168,400~~ | ~~0.0295~~ | ~~0.129~~ | ~~0.050~~ | ~~0.217~~ | ~~0.0045~~ | ~~0.020~~ | ~~0.0032~~ | ~~0.014~~ | ~~0.0004~~ | ~~0.002~~ |
| | | | | | | | | | | ~~0.0885~~ | ~~0.3870~~ | ~~0.1500~~ | ~~0.6510~~ | ~~0.0135~~ | ~~0.0600~~ | ~~0.0096~~ | ~~0.0420~~ | ~~0.0012~~ | ~~0.0060~~ |
| ~~AHU-10~~ | | ~~Roof~~ | ~~Spanish Mites~~ | ~~24,260 CFM (40 HP SF), 93.1 Tons, 1060 MBH, 100% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system (Future)~~ | ~~1050~~ | ~~Btu/SCF~~ | ~~1,010~~ | ~~8,760~~ | ~~8,847,600~~ | ~~0.0505~~ | ~~0.221~~ | ~~0.085~~ | ~~0.372~~ | ~~0.0077~~ | ~~0.034~~ | ~~0.0056~~ | ~~0.024~~ | ~~0.0006~~ | ~~0.003~~ |
| ~~AHU-11~~ | | ~~Roof~~ | ~~SSM Expansion~~ | ~~24,500 CFM (40 HP SF / 15 HP RF), 101.2 Tons, 723 MBH, 85% OA, DX packaged rooftop AHU, indirect gas fired heater, packaged controls for system (Future)~~ | ~~1050~~ | ~~Btu/SCF~~ | ~~689~~ | ~~8,760~~ | ~~6,035,640~~ | ~~0.0345~~ | ~~0.151~~ | ~~0.058~~ | ~~0.253~~ | ~~0.0052~~ | ~~0.023~~ | ~~0.0038~~ | ~~0.017~~ | ~~0.0004~~ | ~~0.002~~ |
| | | | | | | | | | | 0.0850 | 0.3720 | 0.1430 | 0.6250 | 0.0129 | 0.0570 | 0.0094 | 0.0410 | 0.0010 | 0.0050 |
| HB-1 (SRC 1) | CUP | 1st Flr | Heating Hot Water system | Natural gas-fired, fire-tube hot water boiler, 125 BHP | 1050 | Btu/SCF | 5,952 | 8,760 | 52,139,520 | 0.30 | 1.3 | 0.5 | 2.2 | 0.05 | 0.20 | 0.03 | 0.14 | 0.00 | 0.02 |
| HB-2 (SRC 1) | CUP | 1st Flr | Heating Hot Water system | Natural gas-fired, fire-tube hot water boiler, 125 BHP | 1050 | Btu/SCF | 5,952 | 8,760 | 52,139,520 | 0.30 | 1.3 | 0.5 | 2.2 | 0.05 | 0.20 | 0.03 | 0.14 | 0.00 | 0.02 |
| HB-3 (SRC 1) | CUP | 1st Flr | Heating Hot Water system | Natural gas-fired, fire-tube hot water boiler, 125 BHP (Future) | 1050 | Btu/SCF | 5,952 | 8,760 | 52,139,520 | 0.30 | 1.3 | 0.5 | 2.2 | 0.05 | 0.20 | 0.03 | 0.14 | 0.00 | 0.02 |
| HB-4 (SRC 1) | CUP | 1st Flr | Heating Hot Water system | Natural gas-fired, fire-tube hot water boiler, 125 BHP. (Future) | 1050 | Btu/SCF | 5,952 | 8,700 | 52,139,520 | 0.30 | 1.3 | 0.5 | 2.2 | 0.05 | 0.20 | 0.03 | 0.14 | 0.00 | 0.02 |
| SB-1 | CUP | 1st Flr | Humidification | Electric, steam boiler, 45 BHP (Existing) | | | | | | | | | | | | | | | |
| SRC 5 | CUP | 1st Flr | Humidification | Natural gas-fired, fire-tube steam boiler, 50 BHP. (Future) | 1050 | Btu/SCF | 2,381 | 8,760 | 20,857,560 | 0.12 | 0.5 | 0.2 | 0.9 | 0.02 | 0.08 | 0.01 | 0.06 | 0.00 | 0.01 |
| SRC 6 | | | | 1000 kW Generator | 140000 | Btu/gallon | 67.05 | 500 | 33,525 | 12.38 | 3.09 | 7.71 | 1.93 | 0.44 | 0.11 | 1.74 | 0.44 | 0.49 | 0.12 |
| | | | | | | | | | Total | 13.68 | 8.79 | 9.91 | 11.83 | 0.68 | 0.99 | 1.87 | 1.06 | 0.49 | 0.21 |

[1] Natural Gas External Combustion is in SCF and IC Engine is gallons

**Actual Emissions**

It is expected that the generator will operate no more than 200 hours per year. However, to be consistent with the modeling analysis, the following calculations are based on 500 hours per year..

<u>Hourly Actual Emissions</u>

| | |
|---|---|
| $NO_x$: | 0.88 x 6.4 gm/kW-hr x 1,000 kW x 1 lb/453.59 gm = 12.36 lb/hr |
| CO: | 3.5 gm/kW-hr x 1,000 kW x 1 lb/453.59 gm = 7.71 lb/hr |
| $SO_x$: | 67.1 gal/hr x 7.3 lb/gal x 0.0005 lb S/lb oil x 2 lb $SO_2$/lb S = 0.49 lb/hr |
| PM: | 0.20 gm/kW-hr x 1,000 kW x 1 lb/453.59 gm = 0.44 lb/hr |
| NMHC: | 0.12 x 6.4 gm/kW-hr x 1,000 kW x 1 lb/453.59 gm = 1.74 lb/hr |

<u>Annual Actual Emissions</u>

Annual actual emissions are based on the generator operating 500 hr/yr:

$NO_x$: 12.36 lb/hr x 500 hr/yr x 1 ton/2,000 lb = 3.09 ton/yr
CO: 7.71 lb/hr x 500 hr/yr x 1 ton/2,000 lb = 1.93 ton/yr
$SO_x$: 0.49 lb/hr x 500 hr/yr x 1 ton/2,000 lb = 0.12 ton/yr
PM: 0.44 lb/hr x 500 hr/yr x 1 ton/2,000 lb = 0.11 ton/yr
VOC: 1.74 lb/hr x 500 hr/yr x 1 ton/2,000 lb = 0.44 ton/yr

**~~AIR HANDLING UNITS – Source Nos. AHU 1, 2, 3, 4, 6, 7, 8, 9, 10, and 11~~**

~~The 10 air handling units (AHUs) are listed on the emission spreadsheet above. It should be noted that AHU 5, which will serve the warehouse will provide only cooling and humidification; therefore, it does not burn natural gas and is not an emission source. Potential emissions are presented in the above spreadsheet, based on AP-42 emission factors.~~

**~~Actual Emissions~~**

~~Actual emissions are calculated using the same emission factors and the assumption that each unit will operate for the equivalent of maximum capacity for 2,000 hr/yr. The following tables summarize the actual maximum hourly emissions and actual annual emissions from the 11 AHUs.~~

/

~~$NO_x$ Emissions from Air Handling Units~~

| ~~Air Handling Unit~~ | ~~Actual Emissions~~ | |
|---|---|---|
| | ~~Maximum Hourly Emissions, lb/hr~~ | ~~Annual Emissions, ton/yr~~ |
| ~~AHU-1~~ | ~~0.0032~~ | ~~0.0032~~ |
| ~~AHU-2~~ | ~~0.0026~~ | ~~0.0026~~ |
| ~~AHU-3~~ | ~~0.0345~~ | ~~0.0345~~ |
| ~~AHU-4~~ | ~~0.0299~~ | ~~0.0299~~ |
| ~~AHU-6~~ | ~~0.0040~~ | ~~0.0040~~ |
| ~~AHU-7~~ | ~~0.0295~~ | ~~0.0295~~ |
| ~~AHU-8~~ | ~~0.0295~~ | ~~0.0295~~ |
| ~~AHU-9~~ | ~~0.0295~~ | ~~0.0295~~ |
| ~~AHU-10~~ | ~~0.0505~~ | ~~0.0505~~ |
| ~~AHU-11~~ | ~~0.0345~~ | ~~0.0345~~ |

~~CO Emissions from Air Handling Units~~

| ~~Air Handling Unit~~ | ~~Actual Emissions~~ | |
|---|---|---|
| | ~~Maximum Hourly Emissions, lb/hr~~ | ~~Annual Emissions, ton/yr~~ |
| ~~AHU-1~~ | ~~0.005~~ | ~~0.005~~ |
| ~~AHU-2~~ | ~~0.004~~ | ~~0.004~~ |
| ~~AHU-3~~ | ~~0.058~~ | ~~0.058~~ |
| ~~AHU-4~~ | ~~0.050~~ | ~~0.050~~ |
| ~~AHU-6~~ | ~~0.007~~ | ~~0.007~~ |
| ~~AHU-7~~ | ~~0.050~~ | ~~0.050~~ |
| ~~AHU-8~~ | ~~0.0500~~ | ~~0.0500~~ |
| ~~AHU-9~~ | ~~0.05~~ | ~~0.05~~ |
| ~~AHU-10~~ | ~~0.085~~ | ~~0.085~~ |
| ~~AHU-11~~ | ~~0.058~~ | ~~0.058~~ |

~~$PM_{10}$ Emissions from Air Handling Units~~

| ~~Air Handling Unit~~ | ~~Actual Emissions~~ | |
|---|---|---|
| | ~~Maximum Hourly Emissions, lb/hr~~ | ~~Annual Emissions, ton/yr~~ |
| ~~AHU-1~~ | ~~0.0005~~ | ~~0.0005~~ |
| ~~AHU-2~~ | ~~0.0004~~ | ~~0.0004~~ |
| ~~AHU-3~~ | ~~0.0052~~ | ~~0.0052~~ |
| ~~AHU-4~~ | ~~0.0045~~ | ~~0.0045~~ |
| ~~AHU-6~~ | ~~0.0006~~ | ~~0.0006~~ |
| ~~AHU-7~~ | ~~0.0045~~ | ~~0.0045~~ |
| ~~AHU-8~~ | ~~0.0045~~ | ~~0.0045~~ |
| ~~AHU-9~~ | ~~0.0045~~ | ~~0.0045~~ |
| ~~AHU-10~~ | ~~0.0077~~ | ~~0.0077~~ |
| ~~AHU-11~~ | ~~0.0052~~ | ~~0.0052~~ |

~~VOC Emissions from Air Handling Units~~

| ~~Air Handling Unit~~ | ~~Actual Emissions~~ | |
|---|---|---|
| | ~~Maximum Hourly Emissions, lb/hr~~ | ~~Annual Emissions, ton/yr~~ |
| ~~AHU-1~~ | ~~0.0003~~ | ~~0.0003~~ |
| ~~AHU-2~~ | ~~0.0003~~ | ~~0.0003~~ |
| ~~AHU-3~~ | ~~0.0038~~ | ~~0.0038~~ |
| ~~AHU-4~~ | ~~0.0033~~ | ~~0.0033~~ |
| ~~AHU-6~~ | ~~0.0004~~ | ~~0.0004~~ |
| ~~AHU-7~~ | ~~0.0032~~ | ~~0.0032~~ |
| ~~AHU-8~~ | ~~0.0032~~ | ~~0.0032~~ |
| ~~AHU-9~~ | ~~0.0032~~ | ~~0.0032~~ |
| ~~AHU-10~~ | ~~0.0056~~ | ~~0.0056~~ |
| ~~AHU-11~~ | ~~0.0038~~ | ~~0.0038~~ |

~~$SO_x$ Emissions from Air Handling Units~~

| ~~Air Handling Unit~~ | ~~Actual Emissions~~ | |
|---|---|---|
| | ~~Maximum Hourly Emissions, lb/hr~~ | ~~Annual Emissions, ton/yr~~ |
| ~~AHU-1~~ | ~~<0.0001~~ | ~~<0.0001~~ |
| ~~AHU-2~~ | ~~<0.0001~~ | ~~<0.0001~~ |
| ~~AHU-3~~ | ~~0.002~~ | ~~0.002~~ |
| ~~AHU-4~~ | ~~0.002~~ | ~~0.002~~ |
| ~~AHU-6~~ | ~~<0.0001~~ | ~~<0.0001~~ |
| ~~AHU-7~~ | ~~0.002~~ | ~~0.002~~ |
| ~~AHU-8~~ | ~~0.002~~ | ~~0.002~~ |
| ~~AHU-9~~ | ~~0.002~~ | ~~0.002~~ |
| ~~AHU-10~~ | ~~0.003~~ | ~~0.003~~ |
| ~~AHU-11~~ | ~~0.002~~ | ~~0.002~~ |

**PROCESS EMISSIONS:**

Process emissions (particulate, VOC, and TAP) will occur from the following operations at the facility: (i) Timothy, Birch, and Ragweed Pollen Processing, which will take place in dedicated processing areas; (ii) Small Scale Manufacturing (SSM) and U.S. Mites Processing, which will take place in the Administration Building; (iii) the Process Development/Quality Control Laboratory, which will also be located in the Administration Building; (iv) Spanish Mites Processing; and (v) SSM Expansion, both of which will take place in a dedicated building.

<u>POLLEN PROCESSING – Source Nos. EF 2-1, EF 3-1, EF 4-1, EF3-4, EF-VAC, EF 9-1, SRC 24, EF SMDRY, SRC 27, SRC 29, SRC 30, SRC 32</u>

**Potential Particulate Emissions**

Potential emissions from all pollen processing and other processes are calculated using conservative assumptions as follows:

| Source ID | Outlet Concentration | Exhaust Air Flow (scfm) |
|---|---|---|
| EF-VAC | 0.01 | 491 |
| EF 2-1 | 0.01 | 970* |
| EF 3-1 | 0.01 | 6,815* |
| EF 4-1 | 0.01 | 3,140* |
| EF 3-4 | 0.005 | 1,104 |
| EF 9-1 | 0.005 | 5,675 |
| EF SMDRY | 0.01 | 300 |
| SRC 26 | 0.01 | 2,827 |

| | | |
|---|---|---|
| SRC 27 | 0.005 | 5,027 |
| SRC 29 | 0.01 | 500 |
| SRC 30 | 0.005 | 5,027 |
| SRC 32 | 0.01 | 500 |

- Note: The air flow for these sources was used only for the portion of the total source air flow that contained particulate emissions.

The results are summarized in Table 4-1 below.

Table 4-1. Potential Particulate Emissions

| Source ID | Source | Exhaust Air Flow, cfm | Potential Emissions | |
|---|---|---|---|---|
| | | | lb/hr | ton/yr |
| ~~T-21~~ | ~~Timothy Fluid Bed Dryer~~ | ~~5,000~~ | ~~0.43~~ | ~~1.88~~ |
| ~~B-37~~ | ~~Timothy Pneumatic Conveyor~~ | ~~500~~ | ~~0.04~~ | ~~0.19~~ |
| SRC-30 | Birch Building Fluid Bed Dryer (future) | 5,027 | 0.215 | 0.942 |
| SRC-32 | Birch Building Pneumatic Vent (future) | 500 | 0.04 | 0.175 |
| SRC-27 | Ragweed Building Fluid Bed Dryer (future) | 5,027 | 0.215 | 0.942 |
| SRC-29 | Ragweed Building Pneumatic Vent (future) | 500 | 0.04 | 0.175 |
| SRC-24 | Spanish Mite Building Media Prep Vent (future) | 1,250 | 0.11 | 0.482 |
| SRC-26 | Spanish Mite Building Pneumatic Vent (future) | 2,827 | 0.26 | 1.139 |
| ~~A-5~~ | ~~House Vacuum System – Administration~~ | ~~500~~ | ~~0.04~~ | ~~0.19~~ |
| ~~T-22~~ | ~~House Vacuum System – Timothy~~ | ~~500~~ | ~~0.04~~ | ~~0.19~~ |
| ~~B-31~~ | ~~House Vacuum System – Birch~~ | ~~500~~ | ~~0.04~~ | ~~0.19~~ |
| ~~R-28~~ | ~~House Vacuum System – Ragweed~~ | ~~500~~ | ~~0.04~~ | ~~0.19~~ |
| ~~SM-25~~ | ~~House Vacuum System – Spanish Mites~~ | ~~500~~ | ~~0.04~~ | ~~0.19~~ |
| ~~P-1~~ | ~~U.S. Mites/SSM Building Exhaust~~ | ~~14,970~~ | ~~1.28~~ | ~~5.62~~ |
| ~~P-2~~ | ~~Process Development Hoods~~ | ~~5,000~~ | ~~0.43~~ | ~~1.88~~ |
| EF 2-1 | USM Purification Lab Hood Exhausts | 970 | 0.08 | 0.36 |
| EF 3-1 | Pollen Lab Hood Exhausts | 6,815 | 0.58 | 2.56 |
| EF 4-1 | Process Development Lab Hood Exhausts | 3,140 | 0.27 | 1.18 |
| EF 3-4 | Class 2 B2 Biological Safety Cabinet | 1,104 | 0.04 | 0.19 |
| EF-VAC | House Vacuum | 491 | 0.04 | 0.19 |
| EF 9-1 | Timothy Building Dust Collector (future) | 5,675 | 0.24 | 1.06 |
| EF SMDRY | Spanish Mite Fluid Bed Dryer | 300 | 0.03 | 0.11 |

~~Actual Particulate Emissions~~

~~In the Timothy Pollen process, particulate matter will be emitted from the Fluid Bed Dryer/Separator, which discharges through an integral cyclone for product recovery, and then through a secondary cyclone and HEPA filter for emission control. A batch yield of 50 kg of wet product is introduced into the dryer in a one hour period. It is estimated that 0.25 percent of this batch weight passes through the primary and secondary cyclones, to the HEPA filter.~~

~~Inlet to HEPA filter = 50 kg/hr x 2.2046 lb/kg x 0.0025 = 0.28 lb/hr~~

~~The HEPA filter has an efficiency of 99 percent. Therefore, the expected atmospheric emissions are:~~

~~0.28 lb/hr x (1.00 – 0.99) = 0.003 lb/hr~~
~~0.003 lb/hr x 7,000 gr/lb x 1 hr/60 min ÷ 1,000 scf = 0.0004 gr/dscf~~

~~At an operating schedule of 2,600 hr/yr, annual emissions will be:~~

~~0.003 lb/hr x 2,600 hr/yr ÷ 2,000 lb/ton = 0.004 ton/yr~~

**Actual Particulate Emissions**

For the following particulate emission sources, actual hourly_emissions are presumed to be one half of the potential emissions shown in Table 4-1 above. Actual annual emissions are calculated from the actual hourly emissions on the basis of 2,600 operating hours per year. These emissions are summarized in Table 4-2 below.

**Table 4-2. Actual Particulate Emissions**

| Source ID | Source | Exhaust Air Flow, cfm | Actual Emissions | |
|---|---|---|---|---|
| | | | lb/hr | ton/yr |
| ~~T-21~~ | ~~Timothy Fluid Bed Dryer~~ | ~~5,000~~ | ~~0.215~~ | ~~0.28~~ |
| ~~B-37~~ | ~~Timothy Pneumatic Conveyor~~ | ~~500~~ | ~~0.02~~ | ~~0.026~~ |
| SRC-30 | Birch Building Fluid Bed Dryer (future) | 5,027 | 0.108 | 0.14 |
| SRC-32 | Birch Building Pneumatic Vent (future) | 500 | 0.02 | 0.026 |
| SRC-27 | Ragweed Building Fluid Bed Dryer (future) | 5,027 | 0.108 | 0.14 |
| SRC-29 | Ragweed Building Pneumatic Vent (future) | 500 | 0.02 | 0.026 |
| SRC-24 | Spanish Mite Building Media Prep Vent (future) | 1,250 | 0.055 | 0.072 |
| SRC-26 | Spanish Mite Building Pneumatic Vent (future) | 2,827 | 0.13 | 0.169 |
| ~~A-5~~ | ~~House Vacuum System – Administration~~ | ~~500~~ | ~~0.02~~ | ~~0.026~~ |
| ~~T-22~~ | ~~House Vacuum System – Timothy~~ | ~~500~~ | ~~0.02~~ | ~~0.026~~ |
| ~~B-31~~ | ~~House Vacuum System – Birch~~ | ~~500~~ | ~~0.02~~ | ~~0.026~~ |
| ~~R-28~~ | ~~House Vacuum System – Ragweed~~ | ~~500~~ | ~~0.02~~ | ~~0.026~~ |
| ~~SM-25~~ | ~~House Vacuum System – Spanish Mites~~ | ~~500~~ | ~~0.02~~ | ~~0.026~~ |
| ~~P-1~~ | ~~U.S. Mites/SSM Building Exhaust~~ | ~~14,970~~ | ~~0.64~~ | ~~0.832~~ |
| ~~P-2~~ | ~~Process Development Hoods~~ | ~~5,000~~ | ~~0.215~~ | ~~0.28~~ |
| EF 2-1 | USM Purification Lab Hood Exhausts | 970 | 0.04 | 0.052 |
| EF 3-1 | Pollen Lab Hood Exhausts | 6,815 | 0.29 | 0.377 |
| EF 4-1 | Process Development Lab Hood Exhausts | 3,140 | 0.135 | 0.176 |
| EF 3-4 | Class 2 B2 Biological Safety Cabinet | 1,104 | 0.02 | 0.026 |
| EF-VAC | House Vacuum | 491 | .015 | 0.02 |

| | | | | |
|---|---|---|---|---|
| **EF 9-1** | **Timothy Building Dust Collector (future)** | **5,675** | **0.12** | **0.16** |
| **EF SMDRY** | **Spanish Mite Fluid Bed Dryer** | **300** | **0.015** | **0.02** |

HOUSE VACUUM SYSTEM~~S~~ - Source Nos. EF VAC

**Potential Emissions**

Potential emissions from the ~~five~~ vacuum system~~s~~ are based on an outlet concentration of 0.01 gr/dscf and summarized in the particulate emission table.

**Actual Emissions**

The vacuum system~~s~~ will be used for keeping the labs and processing areas as free of airborne and settled particulate matter as possible. It is conservatively estimated that the unit collects 100 lb/day. At a removal efficiency of 99.9 percent, emissions will be:

100 lb/day x (1.00- 0.999) ÷ 8 hr/day = **0.015 lb/hr**

0.015 lb/hr x 2,600 hr/yr ÷ 2,000 lb/ton = **0.02 ton/yr**

**TAP EMISSIONS**

Solvents will be emitted from the removal of the lipid layer surrounding the pollen, referred to as de-fatting the pollen, which is accomplished by washing the pollen in acetone in the Filter/Dryer, which is served by a vent condenser to recover the majority of the acetone. ALK-Abello projects that 4,740 lb/yr of acetone will be emitted from the Timothy Pollen Processing Building.

4,740 lb/yr ÷ 2,000 lb/ton = **2.37 ton/yr**

Based on an operating schedule of 2,600 hr/yr, hourly emissions will be:

4,740 lb/yr ÷ 2,600 hr/yr = **1.82 lb/hr**

It should be noted that acetone is not a VOC or a HAP, but is a non-carcinogenic TAP.

Emissions from processing Birch and Ragweed pollen are projected to be three times the emissions from processing Timothy pollen:

*Acetone*

3 x 1.82 lb/hr = 5.46 lb/hr
3 x 2.37 ton/yr = 7.11 ton/yr

PROCESS DEVELOPMENT/QUALITY CONTROL LABORATORY – Source No. EF 4-1

Acetone, IPA, ethanol, and methanol emissions from this area will be measured and included with all other plant emissions since the emissions of these solvents are calculated as the difference between purchased and recovered quantities. Actual emissions are estimated to be equivalent to those measured from the Spokane facility in 2006.

| Compound | VOC | HAP | TAP |
|---|---|---|---|
| Acetone | | | Non-Carcinogen |
| Isopropyl Alcohol | X | | Non-Carcinogen |
| Ethanol | X | | Non-Carcinogen |
| Methanol | X | X | Non-Carcinogen |

Emissions of these compounds are calculated below.

*Acetone*

1,600 lb/yr
1,600 lb/yr ÷ 2,600 hr/yr = **0.61 lb/hr**
1,600 lb/yr ÷ 2,000 lb/ton = **0.80 ton/yr**

*Isopropyl Alcohol*

78 lb/yr
78 lb/yr ÷ 2,600 hr/yr = **0.03 lb/hr**
78 lb/yr ÷ 2,000 lb/ton = **0.04 ton/yr**

*Ethanol*

127 lb/yr
127 lb/yr ÷ 2,600 hr/yr = **0.05 lb/hr**
127 lb/yr ÷ 2,000 lb/ton = **0.06 ton/yr**

*Methanol*

Methanol emissions are based on 5 percent of ethanol emissions:

0.05 x 127 lb/yr = 6.4 lbs/year
6.4 lbs/year ÷ 2,600 hr/yr = **0.002 lb/hr**
6.4 lb/year ÷ 2,000 lb/ton = **0.003 ton/yr**

U.S. MITES/SMALL SCALE MANUFACTURING – Source No. EF 2-1, 3-1, & 3-4

The Small Scale Manufacturing (including the U.S. Mites) operation is being relocated from ALK-Abello's facility in Spokane, WA for which reliable solvent usage and emission data are available. ALK-Abello is projecting that the Small Scale Manufacturing production at the Post Falls facility will be three times the 2006 production level at the Spokane facility. The processing is on a lab scale or pilot-scale basis and will not create significant emissions; therefore, no control equipment will be needed.

| Compound | VOC | HAP | TAP |
|---|---|---|---|
| Acetone | | | Non-Carcinogen |
| Isopropyl Alcohol | X | | Non-Carcinogen |
| Ethanol | X | | Non-Carcinogen |
| Methanol | X | X | Non-Carcinogen |
| Tetrachloroethylene | X | X | Carcinogen |

Emissions of these compounds are calculated below.

*Acetone*

3 x 1,600 lb/year = 4,800 lb/yr
4,800 lb/yr ÷ 2,600 hr/yr = **1.85 lb/hr**
4,800 lb/yr ÷ 2,000 lb/ton = **2.4 ton/yr**

*Isopropyl Alcohol*

3 x 78 lb/yr = 234 lb/yr
234 lb/year ÷ 2,600 hr/yr = **0.09 lb/hr**
234 lb/year ÷ 2,000 lb/ton = **0.12 ton/yr**

*Ethanol*

3 x 127 lb/yr = 381 lb/yr
381 lb/yr ÷ 2,600 hr/yr = **0.15 lb/hr**
381 lb/yr ÷ 2,000 lb/ton = **0.19 ton/yr**

*Methanol*

Methanol emissions are projected to be 5 percent of the ethanol emissions:

0.05 x 381 = 19.1 lb/year
19.1 lb/year ÷ 2,600 hr/yr = **0.007 lb/hr**
19.1 lb/year ÷ 2,000 lb/ton = **0.01 ton/yr**

*Tetrachloroethylene*

Tetrachloroethylene (perchloroethylene) will be used intermittently for processing certain pollens which cannot be cleaned mechanically. ALK-Abello projects that 500 lb/yr of tetrachloroethylene will be used, of which ⅔ will be recovered and ⅓ emitted.

0.33 x 500 = 165 lbs/year

Since tetrachloroethylene will not be used routinely throughout the year, worst-case hourly emissions are calculated assuming that the entire year's production will occur during a two-week period:

165 lbs/year ÷ (16 hr/day x 6 day/wk x 2 weeks) = **0.86 lb/hr**
165 lb/year ÷ 2,000 lb/ton = **0.08 ton/yr**

SPANISH MITES WASHING – Source No. SM-23

Initial (baseline) ethanol emissions from Spanish Mites processing are projected to be 563 lb/yr (0.28 ton/yr). Using a production schedule of 2,600 hr/yr, baseline hourly ethanol emissions are:

563 lb/yr ÷ 2,600 hr/yr = **0.22 lb/hr**

Ethanol emissions from processing Spanish Mites are projected to eventually increase to 12,287 lb/yr (6.14 ton/yr). Using a production schedule of 2,600 hr/yr, maximum hourly ethanol emissions will be:

12,287 lb/yr ÷ 2,600 hr/yr = **4.73 lb/hr**

*Methanol*

Methanol emissions are projected to be 5 percent of the ethanol emissions:

4.73 lb/hr x .05 = 0.24 lb/hr
0.24 lb/hr x 2,600 hr/yr ÷ 2,000 lb/ton = **0.31 ton/yr**

TAPS SUMMARY

The following table summarizes the emissions of TAPs and compares them to the screening levels (ELs) in IDAPA 58.01.01.585 and 586.

| TAP | Calculated Emissions | | EL, lb/hr |
|---|---|---|---|
| | lb/hr | ton/yr | |
| Acetone | 15.2 | 19.79 | 119 |
| Isopropyl alcohol | 0.12 | 0.16 | 65.3 |
| Ethanol | 4.93 | 6.39 | 125 |
| Methanol | 0.25 | 0.32 | 17.3 |
| Tetrachloroethylene[a] | 0.86 | 0.08 | 0.013 |

[a] Because the hourly emissions for tetrachloroethylene exceed the EL, modeling is required. See Attachment 3 for refined modeling report.

ATTACHMENT 5

UPDATED FACILITY EMISSION CAP CALCULATIONS

ATTACHMENT 5
FACILITY EMISSION CAP DISCUSSION

To obtain the maximum degree of operational flexibility, ALK-Abello is seeking to establish Facility Emission Caps (FECs) for $NO_x$, $PM_{10}$ (short-term and long-term), and perchloroethylene, pursuant to IDAPA 58.01.01.176-181. In accordance with these regulations, the FECs are determined by summing three components:

- Baseline Emissions
- Operational Variability Component
- Growth Component

In Attachment 4 to this application, the potential emissions from each source were calculated based on the assumption that each source would operate at its rated capacity on a continuous basis. Actual emissions were calculated, based on expected operating levels and schedules. Since the facility is new, the actual emissions represent the baseline component of the FEC. The difference between actual and potential emissions represents the operational variability component. The potential emissions from the equipment that ALK-Abello anticipates installing in later phases of the project represents the growth component. Tables 5-1, 5-2, 5-3, and 5-4 summarize these emission rates for $NO_x$, long-term $PM_{10}$, short-term $PM_{10}$, and perchloroethylene, respectively.

## Table 5-1. FEC FOR $NO_X$ EMISSIONS

| Source ID | Source | Baseline Emissions, ton/yr | Operational Variability, ton/yr | Growth, ton/yr | Total Emissions, ton/yr |
|---|---|---|---|---|---|
| HB-1 (SRC-1) | 125-hp Boiler | 0.30 | 1.0 | --- | 1.3 |
| HB-2 (SRC-1) | 125-hp Boiler | 0.30 | 1.0 | --- | 1.3 |
| HB-3 (SRC-1) | 125-hp Boiler | 0.30 | 1.0 | --- | 1.3 |
| HB-4 (SRC-1) | 125-hp Boiler | --- | --- | 1.3 | 1.3 |
| SRC-5 | 50-hp Boiler | --- | --- | 0.5 | 0.5 |
| SRC-6 | 1,000-kW Electric Generator | 1.24 | 1.85 | --- | 3.09 |
| ~~AHU-1~~ | ~~Air Handling Unit – U.S. Mites Inoculation Area~~ | ~~0.0032~~ | ~~0.011~~ | — | ~~0.014~~ |
| ~~AHU-2~~ | ~~Air Handling Unit – U.S. Mites Process Support~~ | ~~0.0026~~ | ~~0.008~~ | — | ~~0.011~~ |
| ~~AHU-3~~ | ~~Air Handling Unit – SSM Pollen Lab~~ | ~~0.0345~~ | ~~0.117~~ | — | ~~0.151~~ |
| ~~AHU-4~~ | ~~Air Handling Unit – PD/QC Lab~~ | ~~0.0299~~ | ~~0.101~~ | — | ~~0.131~~ |
| ~~AHU-6~~ | ~~Air Handling Unit – Administration Building~~ | ~~0.0040~~ | ~~0.014~~ | — | ~~0.018~~ |
| ~~AHU-7~~ | ~~Air Handling Unit – Timothy Pollen Building~~ | — | — | ~~0.129~~ | ~~0.129~~ |
| ~~AHU-8~~ | ~~Air Handling Unit – Ragweed Pollen Building~~ | — | — | ~~0.129~~ | ~~0.129~~ |
| ~~AHU-9~~ | ~~Air Handling Unit – Birch Pollen Building~~ | — | — | ~~0.129~~ | ~~0.129~~ |
| ~~AHU-10~~ | ~~Air Handling Unit – Spanish Mites Building~~ | — | — | ~~0.221~~ | ~~0.221~~ |
| ~~AHU-11~~ | ~~Air Handling Unit – SSM Expansion~~ | — | — | ~~0.151~~ | ~~0.151~~ |
| **TOTAL $NO_x$ FEC** | | **2.14** | **4.85** | **1.8** | **8.79** |

### Table 5-2. FEC FOR $PM_{10}$ EMISSIONS (LONG-TERM)

| Source ID | Source | Baseline Emissions, ton/yr | Operational Variability, ton/yr | Growth, ton/yr | Total Emissions, ton/yr |
|---|---|---|---|---|---|
| HB-1 (SRC-1) | 125-hp Boiler | 0.05 | 0.15 | --- | 0.20 |
| HB-2 (SRC-1) | 125-hp Boiler | 0.05 | 0.15 | --- | 0.20 |
| HB-3 (SRC-1) | 125-hp Boiler | 0.05 | 0.15 | --- | 0.20 |
| HB-4 (SRC-1) | 125-hp Boiler | --- | --- | 0.20 | 0.20 |
| SRC-5 | 50-hp Boiler | --- | --- | 0.08 | 0.08 |
| SRC-6 | 1,000-kW Electric Generator | 0.04 | 0.07 | --- | 0.11 |
| ~~AHU-1~~ | ~~Air Handling Unit – U.S. Mites Inoculation Area~~ | ~~0.0005~~ | ~~0.0015~~ | — | ~~0.002~~ |
| ~~AHU-2~~ | ~~Air Handling Unit – U.S. Mites Process Support~~ | ~~0.0004~~ | ~~0.0016~~ | — | ~~0.002~~ |
| ~~AHU-3~~ | ~~Air Handling Unit – SSM Pollen Lab~~ | ~~0.0052~~ | ~~0.0178~~ | — | ~~0.023~~ |
| ~~AHU-4~~ | ~~Air Handling Unit – PD/QC Lab~~ | ~~0.0045~~ | ~~0.0155~~ | — | ~~0.020~~ |
| ~~AHU-6~~ | ~~Air Handling Unit – Administration Building~~ | ~~0.0006~~ | ~~0.0024~~ | — | ~~0.003~~ |
| ~~AHU-7~~ | ~~Air Handling Unit – Timothy Pollen Building~~ | — | — | ~~0.020~~ | ~~0.020~~ |
| ~~AHU-8~~ | ~~Air Handling Unit – Ragweed Pollen Building~~ | — | — | ~~0.020~~ | ~~0.020~~ |
| ~~AHU-9~~ | ~~Air Handling Unit – Birch Pollen Building~~ | — | — | ~~0.020~~ | ~~0.020~~ |
| ~~AHU-10~~ | ~~Air Handling Unit – Spanish Mites Building~~ | — | — | ~~0.034~~ | ~~0.034~~ |
| ~~AHU-11~~ | ~~Air Handling Unit – SSM Expansion~~ | — | — | ~~0.023~~ | ~~0.023~~ |
| ~~T-21~~ | ~~Timothy Fluid Bed Dryer~~ | ~~0.004~~ | ~~1.876~~ | — | ~~1.88~~ |
| ~~T-37~~ | ~~Timothy Pneumatic Conveyor Release~~ | ~~0.03~~ | ~~0.16~~ | — | ~~0.19~~ |
| SRC-30 | Birch Building Fluid Bed Dryer (future) | --- | --- | 0.942 | 0.942 |
| SRC-32 | Birch Building Pneumatic Vent (future) | --- | --- | 0.175 | 0.175 |
| SRC-27 | Ragweed Building Fluid Bed Dryer (future) | --- | --- | 0.942 | 0.942 |
| SRC-29 | Ragweed Building Pneumatic Vent (future) | --- | --- | 0.175 | 0.175 |
| SRC-24 | Spanish Mite Building Media Prep Vent (future) | --- | --- | 0.482 | 0.482 |

| Source ID | Source | Baseline Emissions, ton/yr | Operational Variability, ton/yr | Growth, ton/yr | Total Emissions, ton/yr |
|---|---|---|---|---|---|
| SRC-26 | Spanish Mite Building Pneumatic Vent (future) | --- | --- | 1.139 | 1.139 |
| ~~A-5~~ | ~~Administration House Vacuum System~~ | ~~0.03~~ | ~~0.16~~ | — | ~~0.19~~ |
| ~~B-31~~ | ~~Birch Pollen House Vacuum System~~ | — | — | ~~0.19~~ | ~~0.19~~ |
| ~~R-28~~ | ~~Ragweed Pollen House Vacuum System~~ | — | — | ~~0.19~~ | ~~0.19~~ |
| ~~T-22~~ | ~~Timothy Pollen House Vacuum System~~ | ~~0.03~~ | ~~0.16~~ | — | ~~0.19~~ |
| ~~SM-25~~ | ~~Spanish Mites House Vacuum System~~ | — | — | ~~0.19~~ | ~~0.19~~ |
| ~~P-1~~ | ~~U.S. Mites/SSM Building Exhaust~~ | ~~0.83~~ | ~~4.558~~ | — | ~~5.388~~ |
| ~~P-2~~ | ~~Process Development/Quality Assurance Lab~~ | ~~0.29~~ | ~~1.593~~ | — | ~~1.883~~ |
| EF 2-1 | USM Purification Lab Hood Exhausts | 0.18 | 0.18 | ---- | 0.36 |
| EF 3-1 | Pollen Lab Hood Exhausts | 1.28 | 1.28 | ---- | 2.56 |
| EF 4-1 | Process Development Lab Hood Exhausts | 0.59 | 0.59 | ---- | 1.18 |
| EF 3-4 | Class 2 B2 Biological Safety Cabinet | 0.10 | 0.09 | ---- | 0.19 |
| EF-VAC | House Vacuum | 0.10 | 0.09 | ---- | 0.19 |
| EF 9-1 | Timothy Building Dust Collector (future) | 0.53 | 0.53 | ---- | 1.06 |
| EF SMDRY | Spanish Mite Fluid Bed Dryer | 0.06 | 0.05 | ---- | 0.11 |
| **TOTAL LONG-TERM $PM_{10}$ FEC** | | **3.03** | **3.33** | **4.135** | **10.50** |

Table 5-3. FEC FOR $PM_{10}$ EMISSIONS (SHORT-TERM)

| Source ID | Source | Baseliue Emissions, lb/hr | Operational Variability, lb/hr | Growth, lb/hr | Total Emissions, lb/hr |
|---|---|---|---|---|---|
| HB-1 (SRC-1) | 125-hp Boiler | 0.05 | --- | --- | 0.05 |
| HB-2 (SRC-1) | 125-hp Boiler | 0.05 | --- | --- | 0.05 |
| HB-3 (SRC-1) | 125-hp Boiler | 0.05 | --- | --- | 0.05 |
| HB-4 (SRC-1) | 125-hp Boiler | --- | --- | 0.05 | 0.05 |
| SRC-5 | 50-hp Boiler | --- | --- | 0.02 | 0.02 |
| SRC-6 | 1,000-kW Electric Generator | 0.22 (50% load) | 0.22 | --- | 0.44 |
| ~~AHU-1~~ | ~~Air Handling Unit – U.S. Mites Inoculation Area~~ | ~~0.0005~~ | — | — | ~~0.0005~~ |
| ~~AHU-2~~ | ~~Air Handling Unit – U.S. Mites Process Support~~ | ~~0.0004~~ | — | — | ~~0.0004~~ |
| ~~AHU-3~~ | ~~Air Handling Unit – SSM Pollen Lab~~ | ~~0.052~~ | — | — | ~~0.052~~ |
| ~~AHU-4~~ | ~~Air Handling Unit – PD/QC Lab~~ | ~~0.0045~~ | — | — | ~~0.0045~~ |
| ~~AHU-6~~ | ~~Air Handling Unit – Administration Building~~ | ~~0.0006~~ | — | — | ~~0.0006~~ |
| ~~AHU-7~~ | ~~Air Handling Unit – Timothy Pollen Building~~ | — | — | ~~0.0045~~ | ~~0.0045~~ |
| ~~AHU-8~~ | ~~Air Handling Unit – Ragweed Pollen Building~~ | — | — | ~~0.0045~~ | ~~0.0045~~ |
| ~~AHU-9~~ | ~~Air Handling Unit – Birch Pollen Building~~ | — | — | ~~0.0045~~ | ~~0.0045~~ |
| ~~AHU-10~~ | ~~Air Handling Unit – Spanish Mites Building~~ | — | — | ~~0.0077~~ | ~~0.0077~~ |
| ~~AHU-11~~ | ~~Air Handling Unit – SSM Expansion~~ | — | — | ~~0.0052~~ | ~~0.0052~~ |
| ~~T-21~~ | ~~Timothy Fluid Bed Dryer~~ | ~~0.43~~ | — | — | ~~0.43~~ |
| ~~T-37~~ | ~~Timothy Pneumatic Conveyor Release~~ | ~~0.04~~ | — | — | ~~0.04~~ |
| SRC-30 | Birch Building Fluid Bed Dryer (future) | --- | --- | 0.215 | 0.215 |
| SRC-32 | Birch Building Pneumatic Vent (future) | --- | --- | 0.04 | 0.04 |
| SRC-27 | Ragweed Building Fluid Bed Dryer (future) | --- | --- | 0.215 | 0.215 |
| SRC-29 | Ragweed Building Pneumatic Vent (future) | --- | --- | 0.04 | 0.04 |

| Source ID | Source | Baseline Emissions, lb/hr | Operational Variability, lb/hr | Growth, lb/hr | Total Emissions, lb/hr |
|---|---|---|---|---|---|
| SRC-24 | Spanish Mite Building Media Prep Vent (future) | --- | --- | 0.11 | 0.11 |
| SRC-26 | Spanish Mite Building Pneumatic Vent (future) | --- | --- | 0.26 | 0.26 |
| ~~A-5~~ | ~~Administration House Vacuum System~~ | ~~0.04~~ | — | — | ~~0.04~~ |
| ~~B-31~~ | ~~Birch Pollen House Vacuum System~~ | — | — | ~~0.04~~ | ~~0.04~~ |
| ~~R-28~~ | ~~Ragweed Pollen House Vacuum System~~ | — | — | ~~0.04~~ | ~~0.04~~ |
| ~~T-22~~ | ~~Timothy Pollen House Vacuum System~~ | ~~0.04~~ | — | — | ~~0.04~~ |
| ~~SM-25~~ | ~~Spanish Mites House Vacuum System~~ | — | — | ~~0.04~~ | ~~0.04~~ |
| ~~P-1~~ | ~~U.S. Mites/SSM Building Exhaust~~ | ~~1.23~~ | — | — | ~~1.23~~ |
| ~~P-2~~ | ~~Process Development/Quality Assurance Lab~~ | ~~0.43~~ | — | — | ~~0.43~~ |
| EF 2-1 | USM Purification Lab Hood Exhaust | 0.08 | — | --- | 0.08 |
| EF 3-1 | Pollen Lab Hood Exhaust | 0.58 | — | — | 0.58 |
| EF 4-1 | Process Development Lab Hood Exhaust | 0.27 | --- | --- | 0.27 |
| EF 3-4 | Class 2 B2 Biological Safety Cabinet | 0.04 | --- | --- | 0.04 |
| EF-VAC | House Vacuum | 0.04 | --- | --- | 0.04 |
| EF 9-1 | Timothy Building Dust Collector | --- | --- | 0.24 | 0.24 |
| EF SMDRY | Spanish Mite Fluid Bed Dryer | 0.03 | --- | --- | 0.03 |
| **TOTAL SHORT-TERM $PM_{10}$ FEC** | | **1.41** | **0.22** | **1.19** | **2.82** |

**Table 5-4. FEC FOR PERCHLOROETHYLENE EMISSIONS**

| Source ID | Source | Baseline Emissions, ton/yr | Operational Variability, ton/yr | Growth, ton/yr | Total Emissions, ton/yr |
|---|---|---|---|---|---|
| ~~P-1~~ | ~~U.S. Mites/SSM Building Exhaust~~ | ~~0.08~~ | ~~0.086~~ | ~~---~~ | ~~0.166~~ |
| EF 3-1 | Pollen Lab Hood Exhausts | 0.08 | 0.086 | ---- | 0.166 |
| **TOTAL PERCHLOROETHYLENE FEC** | | **0.08** | **0.086** | **---** | **0.166** |

**NON-FEC EMISSION LIMITS**

Since a FEC can be established only though dispersion modeling, and modeling was not required for CO, VOC, and $SO_x$, this application does not propose FECs for these pollutants. However, it is necessary to establish emission limits for them. Tables 5-5, 5-6, and 5-7 summarize the calculated CO emissions from combustion sources. Tables 5-8a and 5-8b summarize the calculated TAP emissions and proposed TAP emission limits, respectively. To allow for operating variability, we propose that a 20 percent margin be added to the calculated emission values for CO, VOC, $SO_x$, and TAPs.

**Table 5-5. CO EMISSION LIMITS**

| Source ID | Source | lb/hr | ton/yr |
|---|---|---|---|
| HB-1 (SRC-1) | 125-hp Boiler | 0.5 | 2.2 |
| HB-2 (SRC-1) | 125-hp Boiler | 0.5 | 2.2 |
| HB-3 (SRC-1) | 125-hp Boiler | 0.5 | 2.2 |
| HB-4 (SRC-1) | 125-hp Boiler | 0.5 | 2.2 |
| SRC-5 | 50-hp Boiler | 0.2 | 0.9 |
| SRC-6 | 1,000-kW Electric Generator | 7.71 | 1.93 |
| ~~AHU-1~~ | ~~Air Handling Unit – U.S. Mites Inoculation Area~~ | ~~0.005~~ | ~~0.023~~ |
| ~~AHU-2~~ | ~~Air Handling Unit – U.S. Mites Process Support~~ | ~~0.004~~ | ~~0.019~~ |
| ~~AHU-3~~ | ~~Air Handling Unit – SSM Pollen Lab~~ | ~~0.058~~ | ~~0.23~~ |
| ~~AHU-4~~ | ~~Air Handling Unit – PD/QC Lab~~ | ~~0.050~~ | ~~0.22~~ |
| ~~AHU-6~~ | ~~Air Handling Unit – Administration Building~~ | ~~0.007~~ | ~~0.029~~ |
| ~~AHU-7~~ | ~~Air Handling Unit – Timothy Pollen Building~~ | ~~0.050~~ | ~~0.217~~ |
| ~~AHU-8~~ | ~~Air Handling Unit – Ragweed Pollen Building~~ | ~~0.050~~ | ~~0.217~~ |
| ~~AHU-9~~ | ~~Air Handling Unit – Birch Pollen Building~~ | ~~0.050~~ | ~~0.217~~ |
| ~~AHU-10~~ | ~~Air Handling Unit – Spanish Mites Building~~ | ~~0.085~~ | ~~0.372~~ |
| ~~AHU-11~~ | ~~Air Handling Unit – SSM Expansion~~ | ~~0.058~~ | ~~0.253~~ |
| **TOTAL CO EMISSIONS** | | **9.91** | **11.63** |
| **PROPOSED CO EMISSION LIMITS (120%)** | | **11.89** | **14.00** |

**Table 5-6. VOC EMISSION LIMITS**

| Source ID | Source | lb/hr | ton/yr |
|---|---|---|---|
| HB-1 (SRC-1) | 125-hp Boiler | 0.03 | 0.14 |
| HB-2 (SRC-1) | 125-hp Boiler | 0.03 | 0.14 |
| HB-3 (SRC-1) | 125-hp Boiler | 0.03 | 0.14 |
| HB-4 (SRC-1) | 125-hp Boiler | 0.03 | 0.14 |
| SRC-5 | 50-hp Boiler | 0.01 | 0.06 |
| SRC-6 | 1,000-kW Electric Generator | 1.74 | 0.44 |
| ~~AHU-1~~ | ~~Air Handling Unit—U.S. Mites Inoculation Area~~ | ~~<0.001~~ | ~~0.002~~ |
| ~~AHU-2~~ | ~~Air Handling Unit—U.S. Mites Process Support~~ | ~~<0.001~~ | ~~0.001~~ |
| ~~AHU-3~~ | ~~Air Handling Unit—SSM Pollen Lab~~ | ~~0.0038~~ | ~~0.017~~ |
| ~~AHU-4~~ | ~~Air Handling Unit—PD/QC Lab~~ | ~~0.0033~~ | ~~0.014~~ |
| ~~AHU-6~~ | ~~Air Handling Unit—Administration Building~~ | ~~<0.001~~ | ~~0.002~~ |
| ~~AHU-7~~ | ~~Air Handling Unit—Timothy Pollen Building~~ | ~~0.0032~~ | ~~0.014~~ |
| ~~AHU-8~~ | ~~Air Handling Unit—Ragweed Pollen Building~~ | ~~0.0032~~ | ~~0.014~~ |
| ~~AHU-9~~ | ~~Air Handling Unit—Birch Pollen Building~~ | ~~0.0032~~ | ~~0.014~~ |
| ~~AHU-10~~ | ~~Air Handling Unit—Spanish Mites Building~~ | ~~0.0056~~ | ~~0.024~~ |
| ~~AHU-11~~ | ~~Air Handling Unit—SSM Expansion~~ | ~~0.0038~~ | ~~0.017~~ |
| ~~P-1~~ | ~~U.S. Mites/SSM Building Exhaust~~ | ~~1.107~~ | ~~0.40~~ |
| ~~P-2~~ | ~~PD/QC Lab~~ | ~~0.082~~ | ~~0.103~~ |
| SM-23 | Spanish Mites Washing | 4.97 | 6.45 |
| EF 2-1,3-1 & 3-4 | USM Purification Lab Hood Exhausts, Pollen Lab Hood Exhausts, and Class 2 B2 Biological Safety Cabinet | 1.11 | 0.40 |
| EF 4-1 | Process Development Lab Hood Exhausts | 0.08 | 0.10 |
| **TOTAL VOC EMISSIONS** | | **8.03** | **8.01** |
| **PROPOSED VOC EMISSION LIMITS (120%)** | | **9.64** | **9.61** |

**Table 5-7. $SO_x$ EMISSION LIMITS**

| Source ID | Source | lb/hr | ton/yr |
|---|---|---|---|
| HB-1 (SRC-1) | 125-hp Boiler | <0.001 | 0.02 |
| HB-2 (SRC-1) | 125-hp Boiler | <0.001 | 0.02 |
| HB-3 (SRC-1) | 125-hp Boiler | <0.001 | 0.02 |
| HB-4 (SRC-1) | 125-hp Boiler | <0.001 | 0.02 |
| SRC-5 | 50-hp Boiler | <0.001 | 0.01 |
| SRC-6 | 1,000-kW Electric Generator | 0.49 | 0.12 |
| ~~AHU-1~~ | ~~Air Handling Unit – U.S. Mites Inoculation Area~~ | ~~<0.001~~ | ~~<0.001~~ |
| ~~AHU-2~~ | ~~Air Handling Unit – U.S. Mites Process Support~~ | ~~<0.001~~ | ~~<0.001~~ |
| ~~AHU-3~~ | ~~Air Handling Unit – SSM Pollen Lab~~ | ~~<0.001~~ | ~~0.002~~ |
| ~~AHU-4~~ | ~~Air Handling Unit – PD/QC Lab~~ | ~~<0.001~~ | ~~0.002~~ |
| ~~AHU-6~~ | ~~Air Handling Unit – Administration Building~~ | ~~<0.001~~ | ~~<0.001~~ |
| ~~AHU-7~~ | ~~Air Handling Unit – Timothy Pollen Building~~ | ~~<0.001~~ | ~~0.002~~ |
| ~~AHU-8~~ | ~~Air Handling Unit – Ragweed Pollen Building~~ | ~~<0.001~~ | ~~0.002~~ |
| ~~AHU-9~~ | ~~Air Handling Unit – Birch Pollen Building~~ | ~~<0.001~~ | ~~0.002~~ |
| ~~AHU-10~~ | ~~Air Handling Unit – Spanish Mites Building~~ | ~~<0.001~~ | ~~0.003~~ |
| ~~AHU-11~~ | ~~Air Handling Unit – SSM Expansion~~ | ~~<0.001~~ | ~~0.002~~ |
| **TOTAL $SO_x$ EMISSIONS** | | **0.495** | **0.21** |
| **PROPOSED $SO_x$ EMISSION LIMITS (120%)** | | **0.594** | **0.252** |

Table 5-8a. CALCULATED TAP EMISSIONS

| TAP | Calculated Emissions | | EL, lb/hr |
|---|---|---|---|
| | lb/hr | ton/yr | |
| Acetone | 15.2 | 19.79 | 119 |
| Isopropyl alcohol | 0.12 | 0.16 | 65.3 |
| Ethanol | 4.93 | 6.39 | 125 |
| Methanol | 0.25 | 0.32 | 17.3 |
| Tetrachloroethylene[a] | 0.86 | 0.08 | 0.013 |

Table 5-8b. PROPOSED TAP EMISSION LIMITS (120%)

| TAP | Calculated Emissions | | EL, lb/hr |
|---|---|---|---|
| | lb/hr | ton/yr | |
| Acetone | 18.2 | 23.7 | 119 |
| Isopropyl alcohol | 0.14 | 0.19 | 65.3 |
| Ethanol | 5.92 | 7.67 | 125 |
| Methanol | 0.30 | 0.38 | 17.3 |
| Tetrachloroethylene | 1.03 | 0.10 | 0.013 |

COMPLIANCE WITH FEC REQUIREMENTS

FECs area available only to non-major sources. As shown on Form EI-CP1 and in Attachment 4 (Emission Calculations), the potential emissions from the facility are less than the major source thresholds.

IDAPA 58.01.01.176 through 181 require that emission caps be determined through an ambient air quality dispersion modeling analysis. Attachment 3 contains the report on the refined modeling that was performed in support of the FECs and emission limits summarized above. This analysis was performed in accordance with DEQ's modeling guidance and in close consultation with a Mr. Kevin Schilling of DEQ's modeling group. This analysis demonstrates that even under the worst-case scenario, the facility will not cause an exceedance of any National Ambient Air Quality Standards, nor will it adversely impact a Class I PSD area.

The proposed FECs for $NO_x$, $PM_{10}$, and tetrachloroethylene are consistent with the averaging periods of the respective ambient air quality standard or Acceptable Ambient Concentration. Where appropriate, both long-term and short-term FECs are proposed.

Monitoring for each combustion source (boilers and electric generator) will be performed to satisfy the regulatory requirements. Specifically, the boilers will be equipped with fuel usage meters to monitor monthly fuel usage; the electric generator will be equipped with a non-resettable hour meter to track the operation schedule. Fuel usage in the electric generator will also be monitored to provide information on the power output of the unit. Monitored parameters will be recorded in a permanent, bound logbook on a monthly basis and will be made available to DEQ upon request.

The process sources (including fluidized bed dryers, filter dryers, pan dryers, lab hoods, housekeeping vacuum system, and other sources) will be monitored using material balances on the types and amounts of materials used and recovered. ALK-Abello will develop spreadsheets to calculate emissions from the recorded process data..

Emissions will be calculated on a monthly and 12-month rolling basis using approved emission factors, test data, material balances, or other methods approved by EPA and DEQ. ALK-Abello will submit an annual emission report to DEQ on or before the anniversary date of the permit's issuance. Monthly and 12-month rolling emissions from each source will be included in this report to demonstrate that emissions remained below the FECs and other emission limits throughout the reporting period. The report will also include a summary of emission sources added to and removed from the facility during the reporting period, as well as any changes in fuels, raw materials, or processing methods that have an impact on emissions.

Any material changes at the facility will be evaluated to determine whether the potential exists for an exceedance of the FEC or other emission limit, and whether the potential exists for an increase in ambient air quality concentration of a FEC pollutant. If a positive finding is made concerning either of these tests, ALK-Abello will contact DEQ to discuss the appropriate mechanism for permitting the change.